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Front cover photo reveals a reenactment of the First Thanksgiving, presented at the Naval Hospital Charleston, S.C. in 1971. Governor Bradford proclaims official Thanksgiving. See feature article which begins on page 4.

The page 2 photo was taken at Naval Hospital Port Hueneme, Calif. Considering outpatient records are, from left to right: Surgeon General VADM George M. Davis, MC, USN; HMCS Clinton R. Thorell, Leading Chief, Outpatient Dept.; and CAPT Elgin C. Cowart, Jr., MC, USN, CO Naval Hospital. Youth Opportunity Worker, Miss Lisa L. Holveck is seated in right foreground.

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from the Chief

As we approach the reality of an all-volunteer force and attempt to meet the new and increasing demands for health care services, it is essential to achieve more efficient and effective use of staffing and fund resources available for health care in the Navy. Our objectives are, and will continue to be, to increase and improve health care services and assure patient and staff satisfaction. The availability of health care should be equitable for all personnel and the responsibility for delivery of health care services centralized. These goals and objectives can best be realized by a reorganization of the health care delivery system.

On 1 July 1971, a reorganization of the health care delivery system was instituted in the Tidewater Area of Virginia. All naval medical facilities in the geographic area of Tidewater, Virginia were consolidated into a Naval Regional Medical Center (NRMC) under the command of a Regional Medical Director. The Chief of Naval Operations subsequently approved plans for extension of medical regionalization to other areas and directed major efforts to achieve transfer of responsibility for staffing, funding, and operation of facilities to developing regional medical centers. Medical regionalization of 15 additional areas has now been completed, and 14 other regions are scheduled for establishment by Jan 1973.

This unprecedented program marks the first time in our history that all local naval medical facilities in a given area are consolidated under one Bureau of Medicine and Surgery command activity with direct access and reporting to the Surgeon General.

Regionalization is regarded as a fertile framework in which to incorporate many sophisticated methods of health care delivery which, in themselves, could not entirely resuscitate archaic systems committed to obsolete methods of medical practice. Such modern concepts would include the more effective use of specialists; cross staffing; better use of, and more reliance on, paramedical personnel and allied scientists; decentralization of clinics; centralization and computerization of regional laboratory services; multiphasic screening examinations and problem-oriented medical record systems; less duplication of medical supplies, drugs, expensive equipment and medical services; better emergency and after-hours services; automated data processing and future regional computer centers.

Your continued support is vital to the success of any program. May the union of our combined labor with this new regionalization system bear abundant fruit.



The First Thanksgiving

By The Naval Hospital Charleston, S. C.

Although historians claim that the first Thanksgiving celebration took place on November 23rd, 1623, there are many who feel that the true spirit of this holiday was conceived in the Harvest Feast that occurred in the Fall of 1621, less than one year after the Pilgrims landed at Plymouth in Bay Colony.

During those first 10 months in their New Land, our forefathers encountered innumerable hardships. Of the 102 who had landed from the Mayflower, only 50 survived the cold winter. Thirteen of the 18 women had died, probably having denied themselves their share of rations so that their children might live. During many days of January and February, there were only a handful of men well enough to attempt the work to be done, as scurvy and pneumonia were common throughout the village.

But in spite of their tragic beginning, there were elements of good fortune for the Pilgrims. Their first providential asset was that they had landed in the region of the Patuxet Indian tribe. Two years prior to their arrival, a plague had wiped out the entire tribe and the lands the Pilgrims occupied were virtually uninhabited. (If they had landed in the territory of a strong tribe who jealously guarded their cleared field



The Indians (local chapter members of the Order of the Arrow, Boy Scouts of America) constructed an Indian village adjacent to the meeting place.

and their hunting grounds, the Pilgrims would never have established a foothold on these shores.)

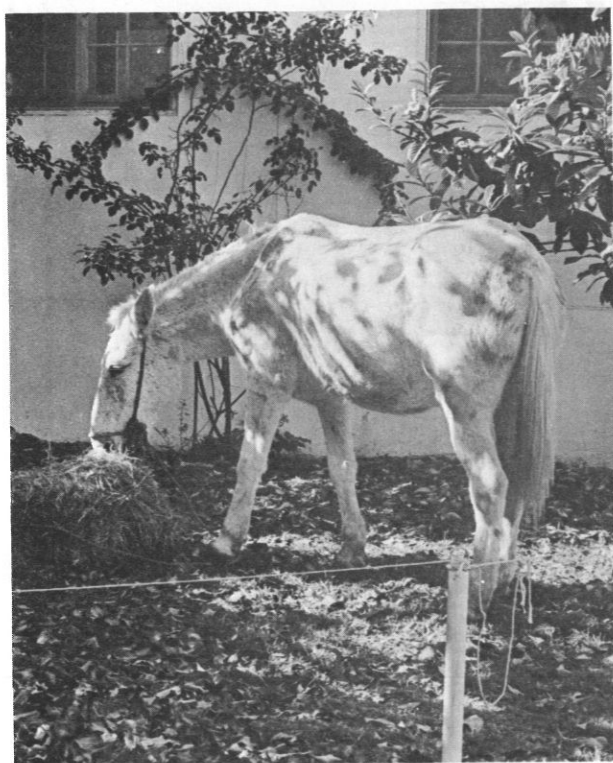
Their greatest boon was an Indian named Squanto, a member of the extinct Patuxet. Shortly before the plague killed his tribe, Squanto had been captured by an English fishing expedition and transported to England. There he learned many of the English ways and in 1621, he gained passage back to his homeland.

Finding his family gone, Squanto went to live among the neighboring Wampanoag tribe. This tribe was aware

The above text and photos were submitted by LT Jack E. McNamara, MSC, USN for Naval Hospital Charleston following their impressive observance of Thanksgiving there in 1971. We think you will agree that the material warrants a spotlight this month. It is exceptionally timely and well done.



Preparation of the feast commenced in the early morning hours.



Many realistic touches were added to create the authentic setting.

of the Pilgrim settlement, but its members were reluctant to interfere with the White Man, fearing that any close contact would result in their catching the plague which had been so tragic for the Patuxet. Squanto, however, went boldly into the Pilgrim encampment. Already a Christian when he joined the colony, he became one of the Pilgrim Saints, as those were called who held to the strictest tenets of the Pilgrim theology. Squanto's gifts as an interpreter, his understanding of the habits and attitudes of the Indians and his knowledge of the techniques of hunting, fishing and farming in that environment were all invaluable to the colonists. It was largely due to Squanto that the Pilgrims were able to establish and preserve peace with their aboriginal neighbors. Governor Bradford records that he was "a special instrument sent by God for their good beyond expectation."

By autumn of their first year in America, the Pilgrims were ready to enjoy a holiday. They had twenty acres of corn, almost ready to harvest, and a firm friendship with the Indians. The woods and rivers were filled with game and fish. As the son of an English farmer, William Bradford was well acquainted with the harvest celebration of his homeland. He also remembered the annual Thanksgiving Day celebrated in Leyden. He proclaimed a similar holiday

here in Plymouth, so that they might "after a more special manner rejoice together."

And so, plans for the first Thanksgiving were underway. The twenty acres of Indian corn yielded an excellent harvest, but the six acres of English barley and peas came to naught. This emphasized in everyone's mind how deeply dependent they were on their Indian allies. Without the corn, they would face a winter of certain starvation — no doubt this was a major reason why Governor Bradford decided to invite their Indian friends to the festival.

A messenger was sent to the Chief Massasoit of the Wampanoag tribe inviting him for the day, and the Governor sent four of his men to the woods "fowling." When they returned, they had killed enough wild turkeys to feed the whole company for almost a week. There were also eels, lobsters and shellfish gathered from the bay, but even this abundance of food seemed insufficient when Chief Massasoit arrived with 90 hungry Indian braves!

The Pilgrims were speechless. They were not prepared to feed the extra guests, expecting only the Chief and a few of his tribal leaders. The Indians, however, were accustomed to a harvest Thanksgiving and knew what was expected of them. (For years they had celebrated their "Green Corn Dance," a ritual of food and games in honor of an abundant harvest.)



Governor and Mrs. William Bradford of Plymouth colony. (Would you believe LCDR Stanley Permowicz, MC, USN and Lady Joann Permowicz?)



Pilgrim LT Jack McNamara, MSC, USN posts proclamation on ye old announcement pole as Governor Bradford stands by.



Patients, staff, and families assemble in the meeting place.

Chief Massasoit sent his braves to the woods and they soon returned with five deer which were presented to Governor Bradford with great ceremony.

In addition to the venison, the menu for the first Thanksgiving included turkeys, wild geese and ducks, clams and oysters. Although the nearby bogs abounded with cranberries, there is no evidence that they served the sauce that is now so traditional at our Thanksgiving meals. Pumpkin pie was certainly not on the menu that fall as it is doubtful that the Pilgrims knew what to do with this vegetable. The Pilgrims sweetened their lips with wine made from the white and red grapes which grew in great abundance in the New England countryside. It is quite probable that the children munched on popcorn balls; it had long been an Indian practice to shake corn over coals in earthen jars, into which maple syrup was then poured to create sticky balls of popcorn.

While the women cooked for the three day feast, the men indulged in games and exercise, while the children competed in pumpkin-rolling contests.

Those few days of abandonment to worldly pleasures were a wholesome release for the colonists, whose lives had been meager and severe. To share what they had in lavish hospitality with their neighbors gave them a sense of well-being, and though they later paid for their generosity in bitter deprivation the following winter, they had no regrets.



Pilgrim sounds bell to open the carefully-planned program.



Enter, the Indian Chief Massasoit (Barry Stamey) and braves of the Wampanoag tribe.

Thanksgiving Day had a special meaning at the Naval Hospital Charleston, S.C. in 1971 when more than 600 members of the staff, patients, and their families gathered to observe a re-creation of the Thanksgiving feast that was held in Plymouth at Bay Colony in 1621.

Preparations for converting the hospital courtyard into a Plymouth settlement began in early October 1971 and received the wholehearted support of the entire Charleston community. Local businessmen happily came to the assistance of the Hospital Food Service Division, providing live animals, pumpkins, wine for the patients, buffet tables, and assorted props. Naval activities at the Charleston Naval Base also became involved in the production, contributing the necessary lumber, printing work, and logistic support.

A week before Thanksgiving, the South Carolina Chapter of the Order of the Arrow Boy Scouts constructed an Indian Village in the courtyard, highlighted by a 16-ft. teepee which was surrounded by authentic wooden furniture and accessories.

The ceremonies for the day closely paralleled the documented history of our 350-year-old heritage. Governor Bradford appeared at 1130 to read the original Proclamation, and announced the arrival of Chief



Chief Massasoit presents peace pipe to Governor Bradford.



Puritan minister Elder Brewster (Chaplain F. Gothard to us) leads the assemblage in melodic prayer — God Bless America.

Massasoit and his braves. To the delight of the more than 100 children present for the festivities, the Indians entered the courtyard carrying a peace pipe which was presented to Governor Bradford as a token of friendship. Chief Massasoit then ordered a "Green Harvest Dance," performed to perfection by the Order of the Arrow Ceremonial Dance Team.

The Thanksgiving Prayer was offered by Elder Brewster, portrayed by the costumed Hospital Chaplain, and the feast commenced.

Before approaching the main banquet table, the pilgrims, Indians and guests sampled the wares of the oyster pit, where fresh oysters were steamed over hot coals. An authentic wooden barrel provided "Elder Brewster's mulled cider," and "crab souppe" was kept piping-hot in an iron kettle that had been suspended from a wooden tripod.

The 40-ft. rough-cut lumber that served as the main table held a bounty of authentic dishes. Venison, turkey, wild geese, lobster tail, and "sallets" from the

community gardens were prominent culinary triumphs. The dessert table offered homemade pumpkin, mince and apple pies (donated by members of the Hospital Wives Club), as well as Indian pudding that was prepared from an original recipe.

While participating in "pumpkin-rolling" contests, the children munched on popcorn balls and molasses cookies.

The true spirit of Thanksgiving was recaptured in this event that transcended 350 years, and the words of Governor Bradford had a special significance for all of those who observed the festivities. Recalling his thoughts on the First Thanksgiving, Governor Bradford wrote:

As one small candle may light a thousand, so the light kindled here has shown unto many, yea, in some sort, to a whole nation. . . . We have noted these things so that you might see their worth and not negligently lose what your fathers have obtained with so much hardship.



At last — guests savor the bounties of Thanksgiving, at the oyster pit.

UNUSUAL STRESS FRACTURES

By LCDR Richard F. Rosenberg, MC, USNR,*
Department of Radiology, U.S. Navy Medical
Detachment, Marine Corps Recruit Depot,
Parris Island, South Carolina.

Stress fractures are not unique at the Marine Corps Recruit Depot, Parris Island, S.C. From 1 Jan 1970 to 31 May 1971 there were 1,230 cases representing 3.5% of the graduates. During this period there were 21,176 man-days lost due to stress fractures. The most common anatomical locations were metatarsal and calcaneal, followed closely by tibial shaft stress fractures.

We have encountered several unusual cases of stress fracture which form the basis of this paper. The case histories are included so that the reader can gain clinical perspective in presenting signs and symptoms.

CASE No. 1. Stress Fracture of the 1st Metatarsal (TL 2756269/1015)

A 21-year-old male in his second week of training reported to sick call because of pain in the first

metatarsal of the right foot while standing at attention. There was point tenderness, edema, and minimal purplish discoloration in the region of the base of the first metatarsal. X-ray studies including anteroposterior (AP), lateral and oblique views of the right foot were obtained on 9 Nov 1971 and these were unremarkable. (See Figure 1) Repeat X-ray studies on 18 Nov 1971 revealed dense, horizontal sclerosis (callus) with localized periosteal new bone formation at the base of the first metatarsal, compatible with a diagnosis of stress fracture. (See Figure 2B)

Comment.

This case is unusual in its anatomic location. Metatarsal stress fractures most commonly involve the second and third metatarsal bones; the first and fifth are usually spared. At the Marine Corps Recruit Depot, the second and third metatarsal bones are the most frequent sites of metatarsal stress fractures. This has also been the experience of Gilbert and Johnson at the Marine Corps Recruit Depot, San Diego, Calif.¹ Our patient was placed in Medical Rehabilitation Platoon (MRP) for 31 days and then returned to training without difficulty.

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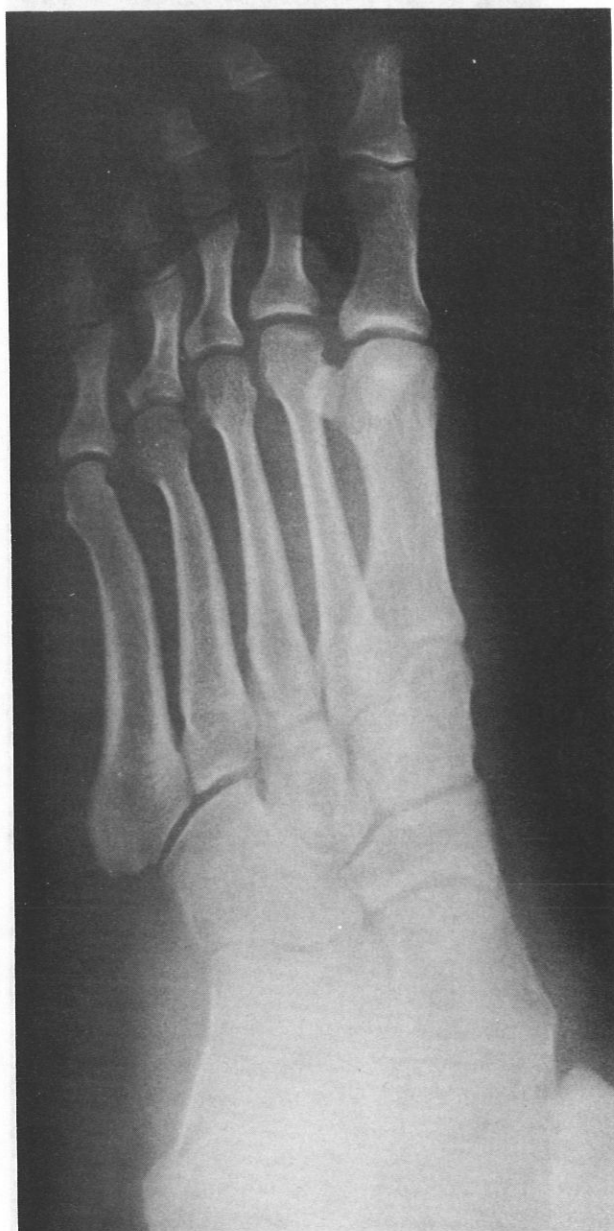


Figure 1 A and B.—Anteroposterior (AP) and oblique X-ray views show no abnormality.

CASE No. 2. Double Stress Fracture of the Calcaneus (RPL 2596520/MRP)

This 18-year-old male was admitted to MRP on 16 Feb 1971 because of bilateral heel pain and X-ray evidence of bilateral calcaneal stress fractures. A routine follow-up film on 1 April 1971 revealed the presence of a second stress fracture located posteriorly in the right calcaneus. (See Figure 3) At this time, the patient was asymptomatic. Comparison with the appear-

ance of the originally-diagnosed right calcaneal stress fracture revealed nearly equal density, suggesting a common time origin for both stress fractures of the right calcaneus.

Comment.

The initial roentgen findings in the case were typical of a calcaneal stress fracture, that is, a dense band of sclerosis (callus) perpendicular to the trabeculae of the bone, and anterior to the insertion of the Achilles'

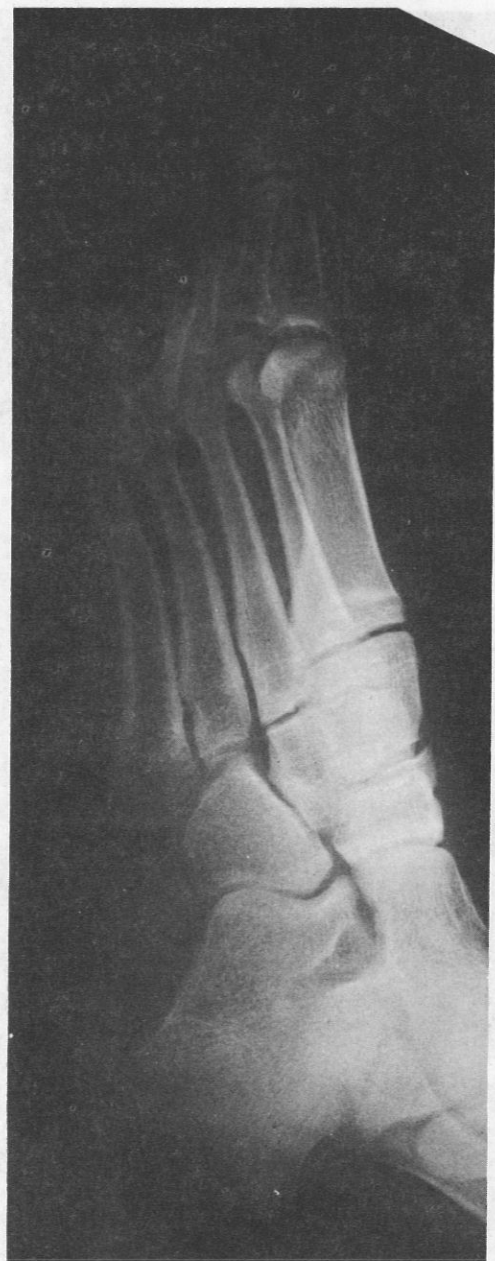


Figure 2 A and B.—AP and oblique X-ray studies reveal fracture at the base of the first metatarsal bone.

tendon.² The unusual feature is the development of a second stress fracture in the same bone despite limited weight bearing and restricted physical activity. We have encountered several additional cases demonstrating this same abnormality. To our knowledge a similar case has not been described.

Calcaneal stress fractures are extremely debilitating and considerable time is lost from training because of them. Approximately 50% of all fracture patients in MRP have calcaneal stress fractures. The resulting

setback in training is four to six weeks, although healing is not actually complete until three months.³

CASE No. 3. Comminuted Stress Fracture of the Femur (APS — 2275539/Cas Co)

This 18-year-old male recruit reported to sick call because of knee pain. There was no history of trauma. AP and lateral roentgenograms of the knee appeared normal. The patient was given three days of "light duty" (no running, marching or physical training) and

a mild analgesic medication. While walking back to his barracks he suddenly heard a snap and fell to the ground with intense pain in his right thigh. Reexamination revealed exquisite local tenderness with inability to bear weight. A single AP X-ray study of the femur revealed the presence of a comminuted stress fracture of the mid-shaft of the right femur. (See figure 4)

Comment.

This case is unusual with respect to the initial symptoms, the subsequent clinical history, and the roentgen findings. In X-ray studies, most stress fractures of the mid-shaft of the femur show periosteal new bone formation (callus) about a small break in the cortex.⁴ A comminuted stress fracture as the presenting sign is rare. Undoubtedly, the fracture existed at the time of the initial physical examination, however, attention was directed to the knee because of referred pain.

The history is also unusual. Most patients report mild to moderate point tenderness of the thigh with pain on weight bearing. Localized edema is often present as well. To suggest that all patients with knee pain

receive X-ray examination of the femur is not our aim. However, when dealing with a stress-fracture-prone population, one must regard all regional osseous structures with suspicion.

CASE No. 4. Stress Fracture of the Clavicle (TBK - 9422/70)

This female marine recruit presented with pain in the right clavicle following a series of push-ups. She was engaged in the early weeks of training. There was no apparent history of trauma. The examining physician found point tenderness and mild puffiness localized at the midpoint of the clavicle. Multiple X-ray studies of this bone revealed a break in the cortex consistent with a diagnosis of stress fracture. (See Figure 5) There was no periosteal elevation or callus formation. A similar situation in a male recruit occurred about one month later.

Comment.

Review of the literature failed to reveal any previously-reported cases of clavicular stress fractures. The

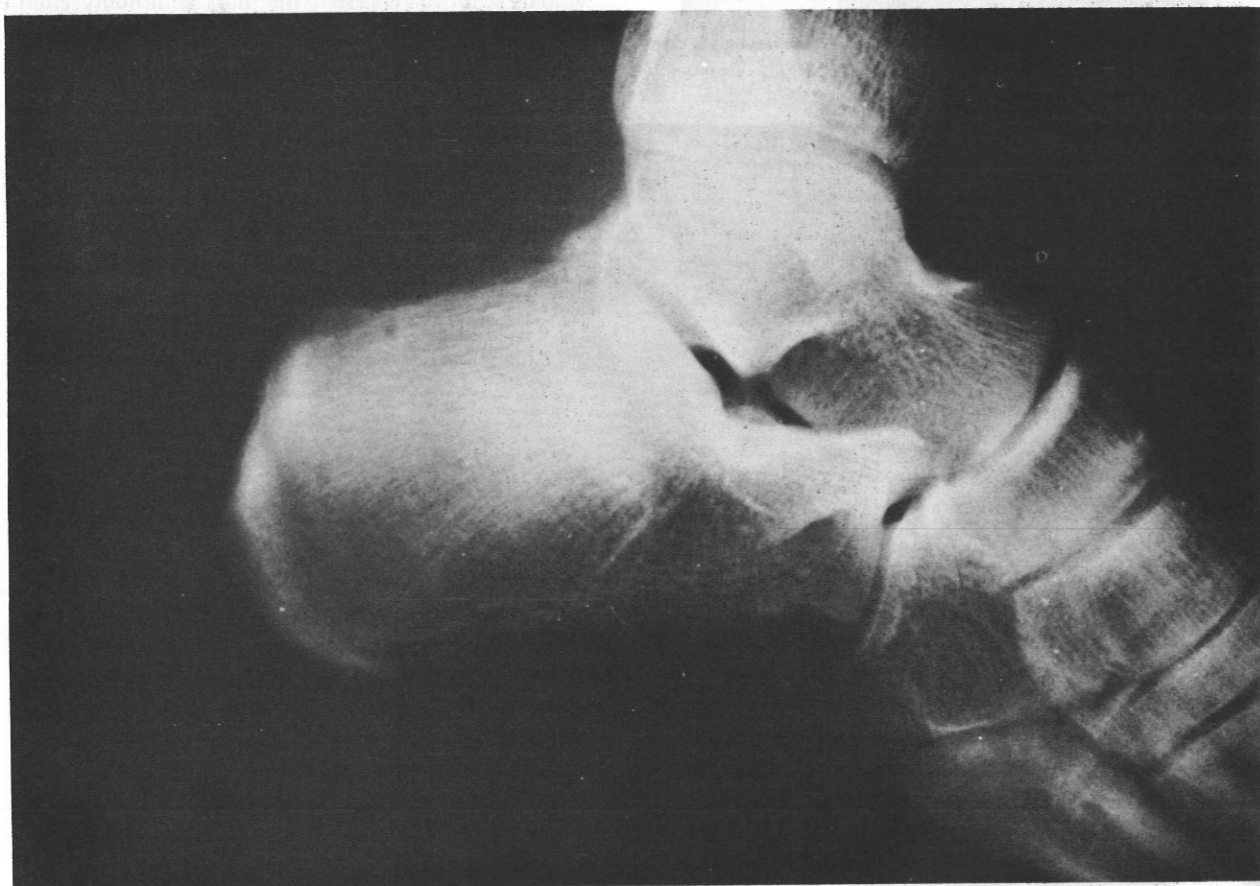


Figure 3.—Lateral view roentgenogram of the calcaneus reveals double stress fracture.

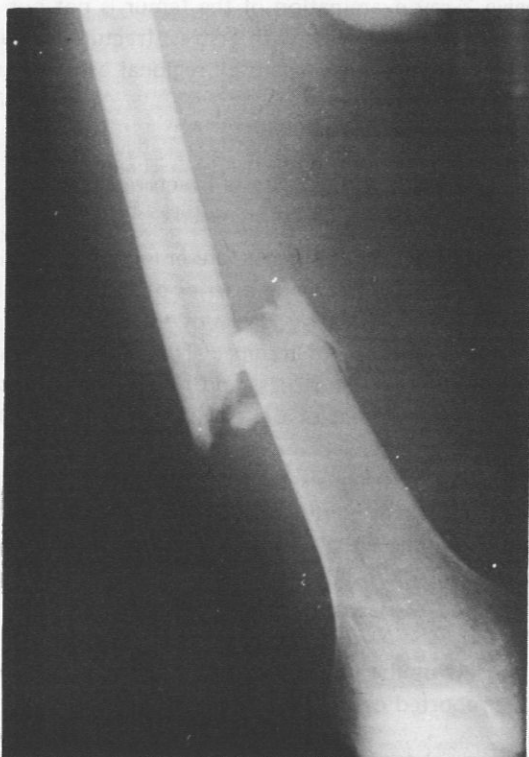


Figure 4.—AP X-ray study of the right femur reveals a comminuted stress fracture of the mid-shaft.

history appears to be compatible with the clinical and roentgen findings, that is, the development of a fracture in a poorly-conditioned patient who stressed the clavicle while doing push-ups. Unfortunately, this patient was lost to follow-up and progressive roentgen changes were not observed.

DISCUSSION

Stress fractures were once considered a medical curio. In 1959, Winfield and Dennis reported 12 cases of calcaneal stress fractures in a five-month period. At present, we frequently observe five to ten cases of stress fractures per week at the Marine Corps Recruit Depot, Parris Island, S.C. Undoubtedly, this is related to a greater clinical and roentgen awareness of the condition.

These unusual fractures are not limited to the military population and have been encountered in diverse types of individuals, from salesmen to nuns. Children and athletes are not exempt. No one specific etiologic factor has been implicated. Sub-threshold trauma and prolonged physical training in poorly-conditioned individuals seem to represent the most commonly cited etiologic features. A high index of suspicion is the key to early diagnosis.

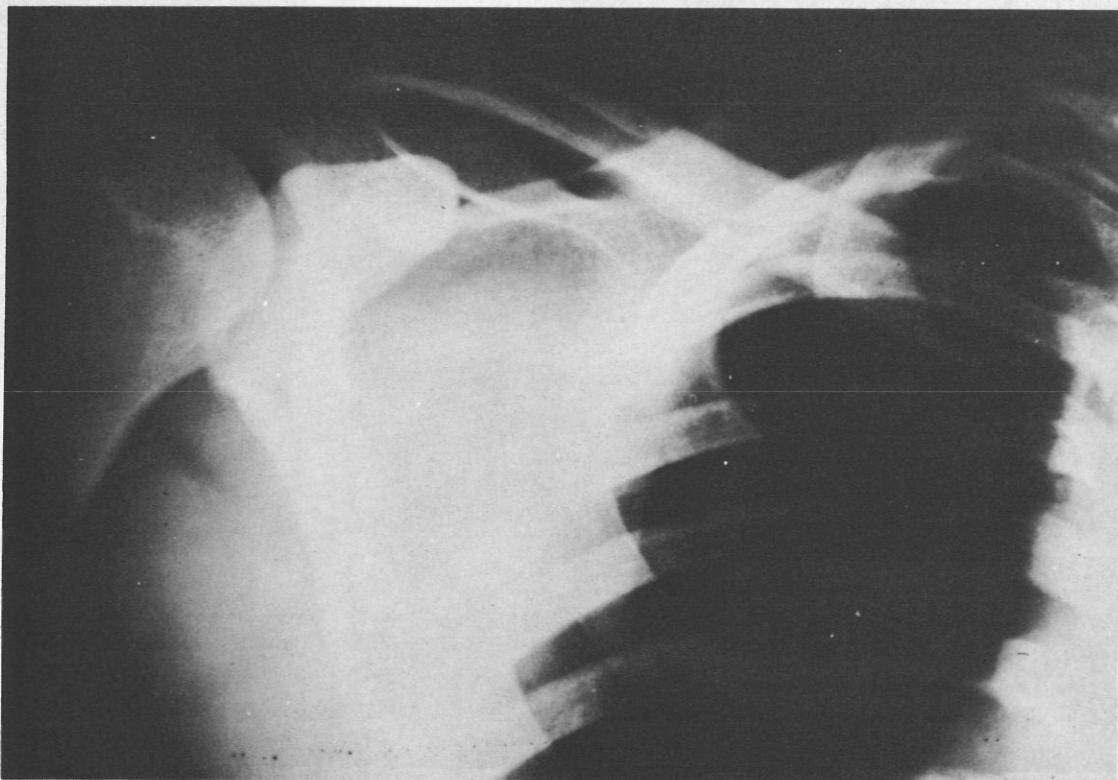



Figure 5.—AP X-ray study of the clavicle reveals a stress fracture of the middle third.

CONCLUSION

Four unusual stress fracture cases are presented and commented upon. These include stress fractures of the 1st metatarsal bone, double stress fracture of the calcaneus, comminuted stress fracture of the femur, and stress fracture of the clavicle. Probable etiologic aspects of the condition are briefly considered.

REFERENCES


1. Gilbert RS and Johnson HA: Stress fractures in military recruits. *Milit Med* 131:8, Aug 1966.
2. Morris JM and Blickenstaff LD: *Fatigue Fractures — A Clinical Study*. Springfield, Ill, Charles C Thomas, 1967.
3. Rosenberg RF: Calcaneal stress fractures: clinical and progressive roentgen features. *US Nav Med* 60:46-50, Oct 1972.
4. Savoca CJ: Stress fractures. *Radiology* 100:519-524, Sept 1971. 

USAF VISITS PENSACOLA

USAF aerospace medicine residents visited Pensacola during 13-15 Aug. The physicians received briefings on training and research at the Naval Aerospace Medical Institute and the Naval Aerospace Medical Research Laboratory.

The visit included a flight from the deck of USS LEXINGTON in the Gulf of Mexico, which the Air Force doctors considered the highlight of the trip.



TO SHARE THE SKY—BRIG GEN George E. Schafer, MC, USAF (left), Commander, Air Force School of Aerospace Medicine, San Antonio, Tex., and RADM Oscar Gray Jr., MC, USN (right), Commanding Officer, Naval Aerospace and Regional Medical Center, Pensacola, Fla., discuss the program for the visit of USAF aerospace medicine residents to Pensacola in Aug.—PAO, Naval Aerospace Medical Center, Pensacola, Fla. 

THE HEMATOLOGISTS' CORNER

HODGKIN'S DISEASE

**By LCDR Agu Suvari, MC, USNR, and
CAPT Richard A. Burningham, MC, USN;
Hematology and Medical Oncology Branch,
Internal Medicine Service, Naval Hospital
Philadelphia, Pennsylvania.**

HISTORICAL BACKGROUND

In 1832 Thomas Hodgkin¹ published a treatise on his personal observation of seven patients who showed "some morbid appearances of absorbent glands and spleen." Subsequent review of his case material has eliminated three of them from the disease entity which we now refer to as Hodgkin's disease. Thirty years later Wilkes² wrote in the "Guy's Hospital Reports" that along with the lymphadenopathy and splenomegaly, he had noted in some of his own 15 patients "a remarkable anemia," and on occasion, visceral involvement with apparently the same process that was involving the lymph nodes. It was at his suggestion, in part, that the disease acquired its eponym.

The opinions or assertions expressed in the above article are those of the authors and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

Greenfield³ shed some light on the histology of the disease by describing, in 1878, increased nodal fibrosis and the presence of multinucleated giant cells. Further histologic characterization was outlined by Goldman in 1892 when he described the frequent presence of eosinophils in the affected lymph nodes. Sternberg confirmed the findings of Greenfield, and in 1898 described giant cells which he felt were peculiar to Hodgkin's disease.

In the English literature, Dorothy Reed⁴ published an extensive monograph in 1902 describing histologic aspects of the disease as well as clinical histories. She ended her paper with the following conclusions:

- 1) We should limit the use of the term Hodgkin's disease to designate a clinical and pathologic entity characterized by progressive lymph gland enlargement.
- 2) The growth presents a specific histologic picture, not a simple hyperplasia, but changes suggesting a chronic inflammatory process.
- 3) The microscopic examination provides sufficient basis for the diagnosis.

- 4) Eosinophils are usually present in great numbers in such growths, but not invariably.
- 5) The pathologic agent is as yet undiscovered.

HISTOLOGY

Since the early observations of Greenfield, Goldman, Sternberg and Reed, considerable attention has been given to the histology of Hodgkin's disease.

In 1937 Jackson⁵ classified the lymph node changes into categories of paraganuloma, granuloma and sarcoma. Paraganuloma was described as bearing little or no resemblance to a true malignancy, either in its histologic picture or its clinical course. The scattered, isolated Sternberg-Reed cells, the lymphocytic infiltration with or without follicle destruction and the complete lack of invasiveness all suggested an infectious process. The category of granuloma represented a mixed population with lymphocytes, abnormal histocytes, Sternberg-Reed cells and fibrocytic elements. He placed in the sarcoma category the tumors in which pleomorphic Sternberg-Reed cells predominated with little representation of the other elements mentioned above.

In 1944, Jackson and Parker⁶ presented a clinical review of 300 patients, whom they had grouped according to histologic type, and showed a prognostic correlation with the histology. For the paraganuloma patients the outlook was very favorable; for the sarcoma patients it was uniformly poor. Their proposed histologic classification was widely used until the Rye Symposium in 1965.⁷

CLASSIFICATION SYSTEMS

For many pathologists, however, the Jackson and Parker category of "granuloma" was too broad and a variety of proposed subclassifications was published. A consistent finding, however, was that a good prognosis correlated with a histological predominance of lymphocytes.

In 1966, Lukes and Butler⁸ advocated abandonment of the Jackson and Parker system, and outlined a new classification with six subclasses:

- 1) Lymphocytic and/or Histiocytic
 - a. Nodular
 - b. Diffuse
- 2) Nodular Sclerosis
- 3) Mixed
- 4) Diffuse Fibrosis
- 5) Reticular

Lukes and Butler performed a histologic and clinical review of 370 cases at the Armed Forces Institute of Pathology, and they described prognostic implications

on the basis of histologic type. They found that with lymphocytic proliferation the median survival was 12.4 years for the nodular type, and 7.4 years for the diffuse; whereas, with diffuse fibrosis the median survival was 0.9 years. The largest group of survivors at 15 years (23/56) were classified in the nodular sclerosis group. The next largest (21/56) comprised the lymphocytic/histiocytic groups. These data were presented at the Symposium on Hodgkin's Disease conducted at Rye, New York, and a simplified version of the Lukes-Butler classification was prepared. This scheme is the most frequently used at present. The terminology recommended is:

- A) Lymphocytic Predominance
- B) Nodular Sclerosis
- C) Mixed Cellularity
- D) Lymphocytic Depletion

While the system of histologic classification with its prognostic implications was evolving, another equally important aspect of Hodgkin's disease was undergoing examination. From the earliest observations, it was recognized that the extent of disease at the onset of therapy was an important factor in predicting the ultimate outcome.

Vera Peters⁹ has reviewed the highlights of the development of clinical staging. She states that clinical classification of Hodgkin's disease was first commented upon by Trousseau in Paris in 1865. He referred to the disease as being either latent, progressive, or cachectic. Gowers in 1878 spoke in terms of "local growth only, local enlargement preponderating, and general uniform affection." In her monograph Dorothy Reed divided the patients into Stage I (lymph node enlargement) and Stage II (progressive cachexia). By the 1940's the classification of Carver resembled current staging terminology. He described patients with Stage I — localized, Stage II — regional, and Stage III — generalized disease. In 1950 Vera Peters also reported on a series of patients treated with radiotherapy and she noted the correlation of prognosis with extent of disease.

In 1955 Jelliffe¹⁰ reported on 227 patients and analyzed therapeutic outcome by staging. His stages included: I — one node group, II — two node groups on the same side of the diaphragm, and III — generalized node involvement; stage III was further subdivided into retroperitoneal involvement only, extranodal disease, and constitutional symptoms. His survival data also correlated closely with extent of disease.

As more data accumulated and the methodology for evaluating extent of disease became more sophisticated, two more categories were added by Henry Kaplan¹¹ in 1962, namely, Stage 0 (no disease detectable after surgical excision), and; Stage IV where disease was

demonstrated in bone marrow, bone, lungs, more than one area of cutaneous or subcutaneous involvement, the GI tract secondarily, and/or the kidney. These various classifications were evaluated by a committee at the 1965 Rye Symposium⁷ where the following classification evolved:

Stage I. One or two contiguous lymph node groups on the same side of the diaphragm.

Stage II. Two or more contiguous or non-contiguous groups on the same side of the diaphragm.

Stage III. Disease on both sides of the diaphragm but confined to nodal tissue including the spleen and Waldeyer's ring.

Stage IV. Extranodal disease.

Further subclasses (A and B) were suggested and based on the presence or absence of systemic symptoms such as pruritus, fever, and sweating.

Since the Rye classifications were formulated, two observations of major significance for staging became apparent. First, if extralymphatic disease is localized and related to adjacent lymph node disease, then patient survival was not adversely affected. Patients with localized extralymphatic disease did as well as comparable patients of the same stage without extralymphatic disease. Secondly, laparotomy with splenectomy was introduced as a method for obtaining more information about the extent of disease in the abdomen. It became necessary, therefore, to reconsider the Rye classifications in the light of these developments.

STAGING CLASSIFICATION

The Report of the Committee on Hodgkin's Disease Staging Classification (chaired by Paul Carbone),¹² recommended two systems of classification: clinical staging (CS) and pathological staging (PS). Clinical staging would be determined by history, physical examination, laboratory tests of urine and blood, radiological studies, isotope scans, and the initial biopsy. Clinical evidence of liver involvement would include an enlarged liver and at least an abnormal serum alkaline phosphatase determination, two different liver function test abnormalities, or an abnormal liver scan and one abnormal liver function test. Clinical evidence of splenic involvement would be demonstrated by: either palpable enlargement of the spleen, confirmed by radiographic or radioisotope studies; or, isotopic scan of the spleen showing marked filling defects. Clinical staging would be easy to assess and reproducible from one center to another. Pathological staging would take into account all the extrapathological data obtained from vigorous staging procedures, and allow more precise comparisons. The pathological staging classification would be

subscripted by symbols to indicate the tissue examined and the histopathologic results, as follows:

N+ or N- Other lymph node positive, or negative for disease by biopsy.

H+ or H- Liver positive, or negative by biopsy.

S+ or S- Spleen following splenectomy.

L+ or L- Lung biopsy.

M+ or M- Marrow biopsy or smear.

P+ or P- Pleural involvement by biopsy or cytologic examination.

O+ or O- Osseous involvement by biopsy.

D+ or D- Skin biopsy.

The Committee recommended that the B subclassification be reserved for those patients with: (a) unexplained weight loss of more than 10% in the six months prior to admission, (b) unexplained fever with temperature above 38° C, and (c) night sweats. You will note that pruritus alone would no longer suffice for a B classification. It was also emphasized that clinical staging and pathological staging classifications only applied to the patient at the time of diagnosis and prior to definitive therapy. The lymphatic structures were defined as the lymph nodes, spleen, thymus, Waldeyer's ring, appendix, and Peyer's patches. Liver involvement is always considered diffused and therefore would indicate Stage IV. Bone marrow biopsy should be taken from an *uninvolved* area of bone, as determined clinically or radiographically. The various stages were then defined as follows:

Stage I. Involvement of a single lymph node region (I) or of a single extralymphatic organ or site (I_E).

Stage II. Involvement of two or more lymph node regions on the same side of the diaphragm (II); or localized involvement of extralymphatic organ or site, and of one or more lymph node regions on the same side of the diaphragm (II_E). An optional recommendation would indicate the number of node regions involved by means of a subscript (e.g. II₃).

Stage III. Involvement of lymph node regions on both sides of the diaphragm (III), which may also be accompanied by localized involvement of extralymphatic organ or site (III_E), or by involvement of the spleen (III_S), or both (III_{SE}).

Stage IV. Diffused or disseminated involvement of one or more extralymphatic organs or tissue, with or without associated lymph node enlargement. The reason for classifying the patient as Stage IV should be identified further through definition of site by appropriate symbols.

Multiple nodules in the lung if limited to one lobe, or perihilar extension associated with ipsilateral hilar adenopathy, would ordinarily be classified as *localized*

extralymphatic disease. Unilateral pleural effusion, with or without lung involvement but with hilar adenopathy, would be considered as localized extralymphatic disease. Some examples of this combined clinical staging and pathological staging classification are noted below.

CS IA PS I_{S-H-N-M-}: Implies clinical Stage I without symptoms, and pathological Stage (PS) I as evidenced by negative spleen following splenectomy, liver biopsy negative, additional lymph node biopsy negative, and marrow biopsy negative.

CS IIA₃PS III_{S+N+H-M-}: Implies clinical Stage IIA. Three lymph node regions involved. PS III with spleen positive, abdominal lymph node positive, liver and marrow biopsies negative.

CS IVB_{LH}PS IV_{H+M-}: Implies clinical Stage IVB with gross evidence of lung and liver involvement and pathological Stage IV, evidenced by positive liver biopsy, with negative marrow biopsy.

CS IIIB PS IV_{H+M-S-}: Implies clinical Stage IIIB with pathological Stage IV on the basis of positive liver biopsy, but negative marrow and spleen biopsies.

No doubt this scheme will be considered rather complicated and further modifications will be made. At the same Symposium, Vera Peters recommended staging on the basis of the TNM (tumor, nodes, metastases) system as applied to solid tumors.¹³

GOALS OF STAGING

Why all the fuss about attempting to further refine and define the disease status in patients with Hodgkin's disease? The answer is rather simple when one considers the goals of staging: first, to facilitate communication and exchange of information; second, to provide guidance in aspects of prognosis and treatment. These goals can only be achieved by condensing a large amount of data into a few numbers, developing a common area of agreement for ensuring uniformity in staging procedures, and avoiding bias among several centers involved in the care of patients with Hodgkin's disease.

Two procedures have increased the accuracy of staging. The first is lymphangiography which was originally introduced in the mid 1950's. The interpretation of this radiographic study by a practiced observer correlates satisfactorily (80%) with surgically-obtained histology. The second procedure, still undergoing close scrutiny, is exploratory laparotomy and splenectomy. The latter procedure helps to identify those patients who have: splenic involvement, nodal disease in lymph nodes not visualized by lymphangiography, hepatic involvement, and other unrecognized intra-abdominal disease. Saul Rosenberg¹⁴ summarized the indications

for exploratory laparotomy and splenectomy at the Ann Arbor Symposium:

If the therapeutic plan is to use radiotherapy only to the known sites of disease, or to limit the use of radiotherapy to those patients with Stage I or II disease above the diaphragm . . . then exploratory laparotomy and splenectomy are indispensable for adequate staging and therapeutic decisions. If the therapeutic plan is to treat so called total nodal fields (including spleen) as a general rule, or for particular patients, even in the absence of identified abdominal disease, then the surgical procedure has only the limited value of identifying the few patients with liver involvement and the facilitation of treatment to some extent.

The staging procedure at Naval Hospital, Philadelphia requires consideration of the following parameters: Complete blood count (CBC), urinalysis, blood urea nitrogen (BUN), creatinine, liver function tests, serum protein electrophoresis, uric acid, calcium, inferior vena cavagram (IVC), intravenous pyelogram (IVP), lymphangiography, liver and spleen scan, liver biopsy (percutaneous), bone marrow biopsy, upper gastrointestinal (UGI) series, barium enema (BE), proctosigmoidoscopy, bone survey, bone scan, selected tomography and exploratory laparotomy in selected patients.

TREATMENT

Once the patient's disease has been histologically established and staging is completed, therapy can be undertaken. Treatment for Hodgkin's disease presently consists of radiotherapy, chemotherapy, or a combination of both. The earlier literature,¹⁵ and even as late as 1963,¹⁶ contains sporadic reports of long-term survivals in patients with localized disease treated by surgical excision with, or without, postoperative irradiation to the surgical bed. All of these reports refer to small series of exceptional cases. Surgery in Hodgkin's disease is primarily a diagnostic modality.

Radiotherapy

René Gilbert¹⁷ was an early advocate of extended field irradiation and published an extensive "state of the art" review on radiotherapy for Hodgkin's disease in 1939. He states that up to 1918 therapeutic observations were anecdotal and, because of variability in apparatus as well as dosimetry, no specific conclusions could be drawn. During the period 1918-1920, however, well-described methodology and apparent beneficial results emanated from the Freiberg and Erlangen Schools in Germany. Gilbert's methodology of therapy in the mid 1930's consisted of teleradiotherapy using

a 180-200 kv machine. The first step was to widely irradiate the regions clinically invaded and, if systemic symptoms persisted thereafter, additional irradiation was delivered to suspected areas including mediastinum, axillae, and para-aortic regions. Using this treatment scheme, with no effort at staging beyond physical and chest X-ray examinations, and no histologic classification, Gilbert analyzed the survival data on 84 patients. He reported a 45% three-year survival and 34% five-year survival. His innovative contributions included segmental radiotherapy with fractionation, extended field or "prophylactic therapy," and emphasis on sufficient dosage to accomplish prolonged remission.

Another therapist who has contributed significantly to progress in the radiotherapy of Hodgkin's disease is M. Vera Peters. She presented accumulated data from 257 patients treated at the Ontario Institute of Radiotherapy during 1924-1942.⁹ Of these cases, 113 were histologically-confirmed cases of Hodgkin's disease with an overall five-year survival of 51%. This was an accomplishment indeed, particularly when coupled with a ten-year survival of 34% which she claimed was four times better than that achieved in previously-reported series. Her treatment plan was modeled after that of Gilbert. More than half of the patients received "intensive" therapy to the involved areas (1800-5000 rads, 400 kv) plus "prophylactic" irradiation to all the more commonly involved lymph node regions. This included 400-800 rads (200 kv) to uninvolved peripheral lymphatic regions, the mediastinal nodes and deep lumbar nodes, through two anterior and two posterior ports (400 rads to each portal). She further analyzed her data in regard to stage of disease, according to the scheme outlined by Jelliffe. When one compares her statistics with present day figures for the Stage I and II cases, the results are quite similar.

In 1955 Jelliffe¹⁰ reported on a series of 227 patients treated at Middlesex Hospital in England utilizing the "prophylactic" method, with doses up to 3000 rads in uninvolved regions. Five-year results were comparable to those of Peters. He further analyzed his data according to histologic pattern using the Jackson-Parker system and presented 100% five-year survival in five cases of Stage I/II paraneoplastic, and 60% five-year survival in Stage I/II granuloma.

Further support for more extensive therapy was given by Henry Kaplan in 1962.¹¹ He compared the results of two treatment programs: one was confined to areas of involvement; the other included extended field irradiation to a mantle distribution, for Stage I and II patients. The "localized" group received 400-500 rads and occasionally up to 1200 rads. The prophylactic group received 2500-4000 rads to a mantle

distribution. The survival data again demonstrate a definite advantage for vigorous local therapy and extended field irradiation. Further developments in the last ten years have produced more energetic machinery, greater sophistication in dosimetry and fractionation, more extensive fields of prophylactic irradiation including total nodal irradiation, and greater care in selection of patients for radiotherapy.

Chemotherapy

During the same 30-year period in which radiotherapy has made such progress, treatment with chemicals has shown improved results. Effective chemotherapy is a relatively late development in the management of Hodgkin's disease.¹⁸ Early reference to chemotherapy is made in Dorothy Reed's article wherein she comments on the use of Fowler's solution (potassium arsenite). Mention of arsenical compounds is also made in Gilbert's paper. The first group of agents to be used was the nitrogen mustards. In 1943 Jacobson and others utilized this agent for patients with lymphomatous disease, with some palliative effect.¹⁹ Following this demonstrated efficacy, other alkylating agents were developed and used for treatment. Such agents included a triethylenemelamine derivative in 1951, and subsequently chlorambucil, busulfan, thio-TEPA (triethylenethiophosphoramide) and cyclophosphamide.²⁰ If used in adequate dosage, these agents all had approximately-equivalent efficacy. In 1960, the *Vinca* alkaloids became available for clinical use; first vinblastine, and later its formyl derivative vincristine. These agents were useful in Hodgkin's disease, but were limited by the cumulative neurotoxicity imposed, especially in the case of vincristine. Two other agents currently used for treating Hodgkin's disease are procarbazine and the adrenocorticoids, which became available by the mid-sixties. All of these drugs were initially used alone and the response rates, in general, ran in the order of 20-30%. The duration of response was short-lived and therapy was often hampered by toxicity.

MOPP Combination

In the mid-sixties early reports on the use of combinations of these agents began to appear in the literature; much more encouraging results in the induction phase, as well as the maintenance of prolonged remissions, were noted. The most extensively tested of these combinations is "MOPP," consisting of mechlorethamine (HN₂, Mustargen), Oncovin (vincristine), procarbazine (Matulane), and prednisone. A recent report²¹ was presented at the ASCO meetings from the Southwest Cancer Control Study Group. One hundred forty-six patients with Stage III or IV disease were treated.

Complete remission (no clinical evidence of disease) was accomplished in 75% of IIIA patients, 77% of IIIB patients, 79% of IVA patients, and 51% of IVB patients. At 35 months, of those patients achieving complete remission, 73% showed no recurrence of disease if they had received maintenance therapy; only 30% showed no recurrence if no maintenance therapy had been used.

Survival data at 44 months after the start of therapy showed 92% survival of those patients who received maintenance therapy and who had achieved complete remission. In the unmaintained complete responders, there was 85% survival. However, for those patients who had shown only partial response or no response with initial therapy, survival rates were 10% and 8%, respectively. In all 15 patients who relapsed after achieving complete response, recurrent disease first appeared in the areas of previous major involvement.

In addition to the MOPP regimen, other chemotherapeutic agents, singly or in combination, are being evaluated. Promising results are being obtained with the nitrosoureas, such as 1,3-bis(2-chloroethyl)-1-nitrosourea (BCNU),²² and 1-(2-chloroethyl)-3-cyclohexyl-1-nitrosourea (CCNU).²³ Young²⁴ presented the results of treating 45 patients who had previously been treated and were "resistant" to alkylating agents, *Vinca* alkaloids, and radiotherapy with BCNU. In this series 21/45 patients showed some objective response, with two patients demonstrating complete response. The responses were relatively short-lived, 16.5 weeks mean duration, although with the two complete responders the duration was 72 weeks and 208 weeks, respectively. Another drug which is receiving considerable attention is bleomycin. This is an antineoplastic antibiotic derived from *Streptomyces verticillus*, first introduced by the Japanese²⁵ in 1965. Early reports of small series²⁶ indicate that this drug can be of use in patients refractory to other modalities of drug treatment. Unfortunately, the responses are again of short duration.

It would seem from the success of MOPP therapy, in comparison to its component drugs used singly, that a similar increase in efficacy and duration of response can be anticipated when these newer agents are used in appropriate combinations. Such new combination regimens are now being evaluated by large national cooperative groups such as the Acute Leukemia Group B (ALGB) and the Eastern Cooperative Oncology Group (ECOG). The Hematology and Medical Oncology Branch of the Naval Hospital in Philadelphia holds membership in both of these groups and participates in their clinical trials.

Combined Therapy

Finally, another approach in the treatment of patients with Hodgkin's disease should be mentioned, namely,

sequential radiotherapy and chemotherapy. In order to evaluate this combined approach, the oncology group at Stanford University²⁷ undertook a prospective randomized study in which patients were treated with radiotherapy alone, or with radiotherapy followed by six courses of MOPP therapy. Their preliminary results indicate that the combined approach is more effective. During the three years of the study, one relapse was observed among the 48 patients who received both modes of therapy. In the "irradiation alone" group, there were 10 recurrences among 54 patients. The observation period to date is too short to determine if there has been a significant increase in survival, but there is a significant increase in the disease-free interval commencing at the time complete response is achieved.

REFERENCES

1. Hodgkin T: On some morbid appearances of absorbent glands and spleen. *Medico-Chirurg Trans Lond* 17:68, 1832.
2. Wilkes S: Cases of enlargement of lymphatic glands and spleen (or Hodgkin's disease). *Guy's Hospital Reports* 11:56, 1865.
3. Greenfield WS: Specimens illustrative of pathology of lymphadenoma and leukocythemia. *Trans Path Soc Lond* 29:272, 1887.
4. Reed DM: On pathological changes in Hodgkin's disease with especial reference to its relationship to tuberculosis. *Johns Hopkins Hosp Rep* 10:133, 1902.
5. Jackson H Jr: The classification and prognosis of Hodgkin's disease and allied disorders. *Surg Gynecol Obstet* 64:465, 1937.
6. Jackson H Jr and Parker F: Hodgkin's disease: General considerations. *N Engl J Med* 230:1, 1944 (Seven papers: 1944-1946).
7. American Cancer Society and National Cancer Institute: Obstacles to the control of Hodgkin's disease: A symposium. Rye, New York. *Cancer Res* 26: (Part 1) 1045-1312, 1966.
8. Lukes RJ, Butler JJ and Hicks EB: Natural history of Hodgkin's disease as related to its pathologic picture. *Cancer* 19:317, 1966.
9. Peters MV: A study of survivals in Hodgkin's disease treated radiologically. *Am J Roentgenol* 63:299, 1950.
10. Jelliffe AM and Thomson MD: Prognosis in Hodgkin's disease. *Br J Cancer* 9:21, 1955.
11. Kaplan HS: The radical radiotherapy of regionally localized Hodgkin's disease. *Radiology* 78:553, 1962.
12. Carbone PP, Kaplan HS, Musshoff K, et al: Report of the Committee on Hodgkin's Disease Staging Classification. Symposium: Staging in Hodgkin's disease. *Cancer Res* 31: 1860, 1971.
13. Peters MV: The need for a new clinical classification in Hodgkin's disease: Keynote address. Symposium: Staging in Hodgkin's disease. *Cancer Res* 31:1713, 1971.

14. Rosenberg SA: A critique of the value of laparotomy and splenectomy in the evaluation of patients with Hodgkin's disease. Symposium: Staging in Hodgkin's disease. *Cancer Res* 31:1737, 1971.
15. Slaughter DP: Hodgkin's disease: 5 year survival rate; value of early surgical treatment. *Am J Roentgenol* 47:596, 1942.
16. Lacher MJ: Role of surgery in Hodgkin's disease. *N Engl J Med* 268:289, 1963.
17. Gilbert R: Radiotherapy in Hodgkin's disease. *Am J Roentgenol* 41:198, 1939.
18. Frei E III and Gamble JF: Progress in the chemotherapy of Hodgkin's disease. *Cancer* 19:378, 1966.
19. Rhoades CP: Official statement concerning therapeutic efficacy of nitrogen mustard. *JAMA* 131:656, 1946.
20. Karnofsky DA: Chemotherapy of Hodgkin's disease. *Cancer* 19:371, 1966.
21. Hersh EM et al: Improved combination chemotherapy (MOPP) in advanced Hodgkin's disease. Eighth Annual Scientific Meeting, American Society of Clinical Oncology, Abstract 28, May 1972.
22. Hessner HE: BCNU: Effects on advanced Hodgkin's disease and other neoplasia. *Cancer* 22:451, 1968.
23. Selawry O and Hansen H: Superiority of CCNU (1-[2-chloroethyl]-3-cyclohexyl-1-nitrosourea; NSC 79037) over BCNU (1,3-bis [2-chloroethyl]-1-nitrosourea; NSC 409962) in treatment of advanced Hodgkin's disease. American Association of Cancer Research Meeting, Abstract 182, May 1972.
24. Young RC et al: Treatment of advanced Hodgkin's disease with BCNU. *N Engl J Med* 285:475, 1971.
25. Umezawa H et al: Studies on bleomycin. *Cancer* 20: 891, 1967.
26. Mosher MB, DeConti RC and Bertino JR: Bleomycin therapy in advanced Hodgkin's disease and epidermoid cancers. *Cancer* 30:56, 1972.
27. Moore MR et al: Sequential radiotherapy and chemotherapy in the treatment of Hodgkin's disease. *Ann Intern Med* 77:1, 1972. ☛

CAPT VOTH AT PENSACOLA

For the sixth time, Naval Reserve Medical Corps CAPT Harold M. Voth spent his annual two weeks' training duty at the Naval Aerospace Medical Institute, Pensacola.

A senior psychiatrist and psychoanalyst on the staff of Menninger Foundation at Topeka, Kan., Dr. Voth delivered eight lectures on psychotherapy and marital therapy for student flight surgeons undergoing training at the Institute. He also worked with the Institute's aerospace medicine resident in neuropsychiatry, acted as consultant to the staff, conducted clinics for student flight surgeons, and gave psychotherapy demonstrations for neuropsychiatry staff members.

Dr. Voth has taught psychoanalytic theory and therapy for many years. He conducts introductory courses in research methods and design, and is well known for his current research. In 1970 he received the William C. Menninger Outstanding Teacher award. Dr. Voth is a distinguished member of numerous scientific organizations, among which are the American Psychiatric Association and American Psychoanalytic Association. He has published numerous articles on clinical subjects as well as on his own investigative work.

He has received a standing ovation by a class of student flight surgeons who recently benefited from his lectures.—PAO, Naval Aerospace Medical Center, Pensacola, Fla.



CAPT Harold M. Voth, MC, USNR ☛

Computer Approach to Diagnosis in Regional Dental Pain

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Although computer-assisted instruction (CAI) has proved to be an effective educational tool on the campuses of colleges and universities for over a decade, only two programs^{1,2} of the six CAI courses reported available for the teaching of a clinical aspect of dentistry,¹⁻⁶ have published evaluations of student performances. In an effort to test the effectiveness and efficiency of teaching utilizing CAI in the differential diagnosis of toothache, a program was written and a study designed to test the hypothesis that following this CAI instructional program ("tootha"),* at least 80% of the participating students would significantly improve ($P < .05$ or better) their ability to diagnose toothache as shown by comparison of their pretest and post-test exams.

*"Tootha" is copyrighted and available for demonstration and analysis at The Ohio State University, Office of Academic Affairs, Dr. G. Ronald Christopher, Coordinator of CAI Activities.

The opinions or assertions expressed in the above article are those of the author and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

Methods and Materials

Sixteen fourth-year dental students were selected at random at the College of Dentistry, The Ohio State University, and used this CAI program in the subject of Differential Diagnosis of Toothache. The course was conducted in the College of Dentistry's CAI Center, where three IBM 2741 teletypewriter CAI console terminals were available.

In addition to the terminal, the following hardware and software were available at each of the three student CAI carrels (Figure 1):

1. A Kodak Carousel 800-slide projector with Caritel front-surface mirror, rear projected screen for the projection of 35 mm Kodachrome slides; plus
2. A six-page console booklet containing instructions; a copy of the College of Dentistry's Dental-Medical History form, and; a list of clinical observations, tests, and procedures available from the computer upon request.

In addition to twelve case histories of toothache, the course of study presented three major divisions of regional pain: (1) reversible pulpal pain, (2) irreversible



Figure 1.—A student carrel at Ohio State University College of Dentistry CAI Center.

pulpal pain, and (3) periodontal pain associated with vital pulps. The program was written in Coursewriter III Language for IBM System 360; the pretest and post-test series of cases were alternated with every other student.

Each case history was presented to the student by a narrated chief complaint and history of the present illness. The student then requested from the computer all additional data required for arrival at the diagnosis. The specific questions that the computer would answer were listed in the console booklet. Answers were obtained simply by typing the pertinent number (e.g., "15 — Do your teeth feel sore when you bite on them?"). The computer responded by printing out a reply and could also refer the student to Kodachrome slides which included: (1) a full-face view of the patient, (2) an intra-oral view of the painful area, (3) a copy of the charting of the patient's carious lesions and periodontal status, (4) a periapical roentgenogram, and (5) a bitewing roentgenogram if a posterior tooth was involved.

The instruction was designed to provide frequent feedback to the student in the initial instructional case history. Less feedback was presented with each successive case history until, with the final instructional case

history, only minimal feedback was received by the student and only after the diagnosis was formed.

Results

The student's performance was evaluated for each case history on the basis of his ability to make an accurate diagnosis and to request at least a minimum number of questions predetermined by the author as essential to making the correct diagnosis.

Individually, 15 of 16 students improved in their critical selection or information-gathering skill, while 13 of 16 students improved in their overall diagnostic skill (gathering information and forming a correct diagnosis). The mean total time taken to diagnose all three pretest case histories was 35 minutes and the mean total time taken to diagnose all three post-test case histories was 32 minutes. When the sixteen students were divided into two equal groups, upper and lower halves according to their cumulative grade-point average and class standing, the behavioral changes between the differences of the mean scores of the upper and lower groups were not significant.

Discussion

The advantages of this CAI program ("tootha") are numerous. As a substitute for the clinical patient, the computer never wearies or becomes annoyed with repeated questions or questioners. The computer-simulated patient is available at all times of the day or night, under the same conditions of investigation, to all students and at their convenience. Results of all tests such as electrical pulp test, thermal tests and roentgenograms, are immediately available for interpretation. Immediate feedback for the student concerning the appropriateness of his questions and the validity of his diagnosis, is ensured. The individual student proceeds at his own pace, freed from embarrassment before his peers or his patient in the face of the slow pace, the inappropriateness of a question, or an incorrect diagnosis. Yet realistic interaction between the learner and the computer is not precluded. Some students actually typed messages to the computer patient, thereby demonstrating a spontaneous and natural involvement with the simulated patient.

Not only does the computer patiently answer all questions, but it acts as a tutor and when assistance is required, guides the student to the correct diagnosis without interposing the personal bias or personality of an instructor. Being cognizant of his own diagnosis, the computer-patient allows for comparison between the student's diagnosis and the correct diagnosis. This

permits prescriptive teaching according to each student's needs. When it becomes necessary to update or to improve the course, the program can be readily revised. The computer is also able to retain student performance data for counseling and analysis.

CAI is an adjunct to chairside teaching, not a rival or alternative to clinical instruction. The maximum exposure of available clinical material is assured by CAI, which prepares a student to approach each of his actual clinical dental patients with a clear idea in mind of the type of information that he wishes to obtain, in a logical sequence for gathering this critical data. The system is based on the premise that accurate diagnosis results from the efficient gathering of selective information which is properly interpreted.

Summary and Conclusions

A CAI program that enhances and evaluates fourth-year dental students' ability to identify the cause of toothache has been presented. The following conclusions are based on the evaluation of performance of sixteen fourth-year dental students selected at random:

1. Students were better at correctly diagnosing the type of regional pain causing toothache if all critical information essential to establishing the diagnosis was gathered, than if insufficient critical information was gathered.
2. Students did improve their ability to gather critical information necessary to the diagnosis of toothache caused by regional pain, following this exposure.
3. Post-testing demonstrated that the overall diagnostic skill of students improved in the diagnosis of toothache.
4. The lack of significant difference between the

performances of the upper academic group and the lower academic group indicated that this CAI course on the differential diagnosis of toothache was of equal value to all students regardless of their academic ability.

5. Post-test sampling indicated that the students were able to gather more essential information and diagnose more accurately, in less time, than before.

6. A computer can adequately simulate a clinical patient with toothache caused by regional pain.

7. Through CAI, fourth-year students at The Ohio State University College of Dentistry developed a rational and efficient approach to the differential diagnosis of regional pain.

REFERENCES

1. Sokolow S and Solberg W: Computer assisted instruction in dental diagnosis: a product development. *J Dent Educ* 35: 349-355, 1971.
2. Mullaney TP and Duell RC: Use of Computer Assisted Instruction for Endodontic Diagnosis Problem Solving. Presentation at Workshop on the Exchange of Instructional Materials, College of Dentistry, University of Kentucky, June 1971.
3. Killip DE: Clinical Education in Dentistry. In Stolurow, LM, et al: *Computer Assisted Instruction in the Health Professions*, Newburyport, Mass., 1970, Entelek Inc., pp. 165-175.
4. Gaston, GW: Computer assisted instruction in dental education. *J Dent Educ* 35:283-288, 1971.
5. *Computer Assisted Instruction Guide*, Newburyport, Mass., 1968, Entelek, Inc.
6. Kamp M, et al: Computer simulation of dental history taking, *IADR Abstr* p. 234, Mar 1971.
7. Cassidy RE, Marshall FJ, Gaston GW and Snodgrass M: Computer assisted instruction for diagnostic problem solving of toothache. *J Dent Educ* 36:46-56, Mar 1972. ☛

TIME MEASUREMENT

The Time and Navigation satellite system, pioneered by the Naval Research Laboratory here, has proven to be an ideal method for measuring time to within a half microsecond, or one-half of a millionth of a second.

In a joint British-U.S. experiment, time standards at the Royal Greenwich Observatory at Herstmonceux, Sussex, England and the U.S. Naval Observatory here were compared for the first time by means of a cesium-beam atomic clock on board a satellite.

With the advent of supersonic aircraft, the accuracy of worldwide time measurement has become vitally important for proposed aircraft collision avoidance systems. Since knowledge of time affects distance measurement and navigation, highly accurate clocks will insure that adequate separation can be maintained between aircraft throughout the world.

Currently, time standards at various sites throughout the world are compared by using portable cesium-beam atomic clocks carried in aircraft, or by means of the Loran-C navigation system operated by the U.S. Coast Guard.—NAVNEWS, Washington, D.C. ☛

THE CORONARY ARTERY DISEASE PROBLEM:

A Proposal to Lower Its Incidence in

Active Naval and Marine Corps Personnel

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Coronary Artery Disease (CAD) is the leading cause of death from disease among active duty U.S. Navy and Marine Corps personnel. Between 1 July 1966 and 30 June 1970, CAD caused 324 deaths in this group.¹ An even larger number was lost from the active duty population because of disability resulting from CAD. Each year the average permanent loss of active duty Navy and Marine Corps personnel due to CAD, either by reason of death or medical separation, is approximately 360 persons.¹ The expense of training replacements for these persons is estimated to cost in excess of \$36 million.¹ Many others are temporarily lost from duty

while convalescing from acute myocardial infarction. Almost invariably the active duty man who develops clinical manifestations of CAD is at the peak of his productivity, responsibility, and value to his employer.

Recently, widespread interest has developed in discovering the means of decreasing the impact of arteriosclerosis in this country. President Nixon has urged massive increases in the national budget funds for research directed toward elimination of arteriosclerosis. In recent years several groups have been commissioned by the National Institutes of Health to study the problem.^{2,3} Similarly, Navy physicians have a strong interest in controlling this disease which is of such immense economic importance, which could impair military readiness, and which, if unabated, will kill more than half of the individuals whose health Navy physicians must protect.⁴

There are gross deficiencies in the available scientific knowledge of arteriosclerosis and we lack a total understanding of the means by which the pathologic

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The opinions or assertions contained herein are those of the authors and are not to be construed as official or as necessarily reflecting the views of the Navy Department or the naval service at large.

process may be controlled. Yet, while intense research efforts are being mounted in order to cope more adequately with deficient scientific knowledge, a fund of data is already available to form a sound basis for organizing a program to diminish the impact of CAD. The major medical responsibilities which must be considered in designing such a program include the following: medical treatment of symptomatic CAD, detection of asymptomatic CAD, and prevention of CAD.

The Symptomatic Patient

Since the Navy's first Coronary Care Unit was opened in 1967,⁵ the quality of hospital care for patients with symptomatic CAD has been greatly enhanced. Current experience indicates that 91.5% survival is attainable in patients hospitalized with acute myocardial infarction.⁶ Sophisticated procedures, such as selective coronary arteriography and surgical myocardial revascularization, are readily available; patients have been returned to full active duty status following successful myocardial revascularization performed at Naval Hospital, Bethesda. Despite these advances in medical care of symptomatic patients who reach major medical facilities, a solution to the problem of sudden cardiac death eludes Navy physicians just as it eludes the civilian physician. More than half of all persons who die of acute myocardial infarction do so before reaching medical care, even though most of them have experienced prior warning symptoms which they failed to recognize or to heed. Hence, it is essential that the Medical Department of the Navy initiate a massive education program to encourage patients to seek medical care early in the course of acute myocardial infarction. Also, to facilitate the provision of prompt expert care to the patient with pre-infarction symptoms, or to the patient in an early stage of acute myocardial infarction, extensive consultative services should be made available to isolated medical facilities, such as small dispensaries and ships at sea. Communication by short-wave radio and television circuits, providing prompt long-distance consultative services by specialists at naval hospitals, would be of particular benefit in situations where paramedical personnel alone provide the primary medical care. Also, consideration should be given to the development of specially-equipped ambulances and helicopters, for rapid transportation of patients with suspected acute myocardial infarction, to the nearest military or nonmilitary hospital with modern Coronary Care Unit facilities.

The Asymptomatic Patient

Various screening procedures have been employed to detect coronary atherosclerosis prior to the appearance of overt clinical manifestations. Such measures have

included annual physical examination, routine electrocardiogram, and exercise stress testing. With the exception of stress testing, these techniques for identifying patients with occult CAD have provided notoriously low yields. Recently, the Navy Medical Department recognized the impracticality of the annual physical examination and extended the interval between examinations to three years for officers under 36 years of age. Despite the relative inadequacy of standard electrocardiography for detecting CAD, this technique does offer the advantage of requiring relatively little physician time. Although electrocardiographic exercise stress testing is considerably more productive, it would be difficult to implement on a large scale, at the present time, due to a lack of facilities and medical manpower.

Two avenues of approach warrant serious consideration. One is a risk factor detection program in which persons found to be at increased "risk" would undergo more extensive diagnostic evaluation and receive appropriate preventive treatment. Patient education is the second approach for the person with "asymptomatic" CAD. As many as 60% of acute myocardial infarction patients experience intermittent chest pain, antedating the myocardial infarction by as long as three months. An intense personnel education program is required to get these "asymptomatic" persons to earlier medical care.

CAD Prevention

As in the case of unexpected cardiac arrest, other major complications of CAD, including severe angina pectoris and congestive heart failure, are frequently not reversible by medical measures currently available or under development. Hence, the ideal solution to the problem of CAD is to prevent its occurrence. Current statistical data and research information indicate that this can be best approached through the elimination of certain "risk factors" which are associated with an increased incidence of CAD. Hyperlipidemia, hypertension, and smoking are major risk factors. Minor risk factors include carbohydrate intolerance, lack of physical fitness, obesity, the coronary-prone personality, and a family history of CAD.³

Several studies support the thesis that dietary manipulation of lipids can alter the course of CAD.^{7,8} A more promising course would be to alter the diet of an entire population, by reducing the intake of cholesterol and animal fats to prevent, or to impede, the onset of CAD. At the present time diets generally provided in Navy and Marine Corps messing facilities are heavy in eggs, whole milk, butter, ice cream, and deep-fried foods — the antithesis of the diet recommended by the National Institutes of Health.^{2,3} The average food

ration in military messing facilities is also excessive in caloric content, promoting obesity and lack of physical fitness. The Medical Corps rather than the Supply Corps, as is the present practice, should have primary responsibility for diets in the messing facilities.

Recently an extensive study conducted in the Veterans Administration hospitals decisively established the value of blood pressure control in reducing the risk of strokes and congestive heart failure. The incidence of coronary insufficiency also appeared to be lowered.⁹ Detection and control of hypertension are important in a coronary artery disease control program.

It has been conclusively demonstrated that cigarette smoking promotes CAD.^{10,11} This habit is unwittingly encouraged in the armed forces by the sale of cigarettes without federal tax in ships and at reduced cost in military exchanges. Cigarettes have been provided in "survival kits" for downed aircraft crews and shipwrecked men. The CAD risk factor of cigarette smoking should be publicized, as one important aspect of a CAD prevention program. Personnel should be appropriately informed of the dangers of smoking and cut-rate cigarette sales in exchanges and ships should be eliminated.

Since 1967, patients with diabetes mellitus controlled by oral agents and/or diet have generally been allowed to remain on active duty in the Navy and Marine Corps. In addition to the well-known association of carbohydrate intolerance and CAD, there is recent evidence to suggest that oral hypoglycemic agents themselves contribute to CAD.¹² Such patients assume an increased risk for CAD and should receive periodic medical evaluations, to facilitate early detection, and, to identify additional complicating risk factors.

Great emphasis is placed on physical fitness in the military because of the beneficial effects of physical fitness on life expectancy¹³ and on the ability of individuals to carry out many physically-demanding tasks. Recently, a study comparing the level of physical fitness in untrained U.S. Air Force recruits and Austrian Army counterparts demonstrated an alarming lack of fitness in the American group.¹⁴ U.S. Navy and Marine Corps recruits come from this same poorly-conditioned, teen-age population. In the early 1960s, in response to President Kennedy's interest in physical conditioning, physical fitness tests were administered to active duty personnel several times a year. Since the abandonment of this unsuccessful program, only modest attention has been paid to physical fitness in the Navy. It is apparent that an organized continuous conditioning program is the only way to promote widespread individual fitness. Perhaps consideration should be given to incorporation of individual fitness testing

into the monthly Commanding Officer's personnel inspection. Maintenance of fitness could be effectively encouraged by a reward system, or perhaps by inclusion of performance grades in the professional fitness report.

Obesity has been associated with an increased incidence of CAD. The Army reported a series of active-duty men under the age of 40 years, who had sustained acute myocardial infarctions; 65% were obese, compared to a matched control group in which 38% were obese.¹⁵ Overweight is also a problem in the Navy and the Marine Corps. An effective program to combat obesity could be combined with physical fitness testing.

The competitive, time-oriented personality pattern characterizes the coronary-prone person.¹⁶ Since this personality pattern is considered advantageous in the military leader, and is highly desired in the recruitment of officer candidates, perhaps the risk factor must be accepted. However, this aspect of personality configuration warrants detailed consideration by a psychiatric research group.

Family history is an important risk factor. The potential danger of suffering a myocardial infarction is significantly increased when CAD has occurred in close relatives before the age of 50 years.¹⁷ For obvious reasons, this factor does not lend itself readily to medical intervention. However, family history is readily suited to screening procedures. If this risk factor were recognized in an individual at the time of entrance into the military service, closer medical scrutiny, including exercise stress testing, could be exercised on a regular basis.

Preenlistment and Pre-Commission Screening Procedures

Frequently, various forms of cardiovascular disease are not detected on entrance into the service.¹⁸ In addition to a very thorough physical examination at the time of commencing active duty, the medical family history, a base line electrocardiogram, and an evaluation of lipid and carbohydrate status should be obtained. Such measures would improve present methods of excluding persons with significant cardiovascular disease from the service, or would more accurately identify those persons at increased risk for CAD, on their entry into the Navy and Marine Corps.

Recommendations

The CAD problem in the Navy and Marine Corps has serious economic and military impact. Intensified efforts to combat serious economic problems and the potential threat to military readiness, are justified. These efforts to reduce the CAD problem should be directed in three ways.

Table 1.—Proposed Screening Procedures for the Early Detection of CAD Risk Factors

	Symptoms ¹	Family History	Physical Examination	Glucose and Lipids	Electrocardiogram	EST ²	Blood Pressure ³	Weight ³	PFT ⁴
Entrance into active duty ⁵	X	X	X	X	X		X	X	X
Every month								X	X
Every year	X			X	X		X		
Every three years under age 30 years				X		X			
Every year over age 30 years			X			X			

1. Automated computerized history preferred over perfunctory form SF 93 "Patient Medical History."
2. Exercise stress testing with electrocardiographic monitoring on a limited-trial basis for those possessing risk factors.
3. Accomplished by hospital corpsman.
4. Physical fitness testing to be performed on entry into the service and then monthly thereafter.
5. With the exception of family history and physical fitness testing, any abnormality is considered disqualifying.

An aggressive educational program should be directed at military men and their families. A personal approach defining the individual serviceman's particular susceptibility to CAD, as well as an active education program underscoring the symptoms of impending myocardial infarction, would be the essential ingredients of this phase of an organized attack on CAD in active duty personnel. The program should generate an awareness of CAD risk factors and promote maximal individual cooperation with an anti-risk factor campaign.

Second, it is recommended that the Medical Department provide an ongoing CAD detection and prevention program. For the purposes of detection, periodic examination (including assay of symptoms, signs, lipid and carbohydrate status), blood pressure and weight control can be completed as outlined in Table 1. Cooperation of the Navy line and Supply Corps officers will be required for success in physical fitness testing and dietary control. Since scientists who doubt the true value of physical fitness do remain, a pilot study exploring the value of physical fitness may be advisable. Probably the easiest and most informative test to administer is the 12-minute field test,¹⁹ which measures the distance a subject can run in 12 minutes. The subjects perform in shorts and gym shoes; the simplicity and lack of requirement for complicated equipment are genuine advantages; and well-accepted norms have been defined. Healthy men under 35 years of age

should be able to complete one and one-half miles in 12 minutes. Extensive literature describing diets low in cholesterol and animal fats is available to all. A pilot study of messing facilities in ships might appropriately initiate a Navy-wide change in animal fat-cholesterol consumption.

Third, it is proposed that a more sophisticated system be devised to recognize CAD risk factors in persons applying for entrance into military service. Individuals who present certain high-risk factors, for example, type II hyperlipoproteinemia, should be found disqualified for military service. Other risk factors detected at the time of entry might simply require closer individual scrutiny and intensified application of preventive measures for CAD (Table 1).

REFERENCES

1. Vieweg WVR and Lee DA: Coronary artery disease: its impact on the U.S. Naval and Marine Corps personnel. *Milit Med* (in press).
2. Arteriosclerosis. A report by the National Heart and Lung Institute Task Force on Arteriosclerosis, June 1971. Vol 2, National Institutes of Health (DHEW Publication No. [NIH] 72-219). Washington DC, 1972.
3. Stamler J, Chairman, Atherosclerosis Study Group; and Lilienfeld, Chairman, Epidemiology Study Group: Primary prevention of atherosclerotic diseases. *Circulation* 42:A-55, 1970.

4. Vital Statistics of the United States, 1967. Vol 2, Parts A and B, Mortality, U.S. Department of Health, Education and Welfare, Public Health Service. Washington DC, 1969.
5. Wolff GA, Proulx RA, Vieweg WVR and Riley JA: The Navy's first coronary care unit: a review of 16 months' experience. *Milit Med* 134:431, 1969.
6. Vieweg WVR, Anderson SE, Capone RJ and Proulx RA: The Navy's first coronary care unit: a follow-up report. *Milit Med* 136:728, 1971.
7. Leren P: The Oslo diet-heart study. Eleven-year report. *Circulation* 42:935, 1970.
8. Bierenbaum MI, Fleischman AI, Green DP, Raichelson RI, Hayton T, Watson PB and Caldwell AB: The 5-year experience of modified fat diets on younger men with coronary heart disease. *Circulation* 42:943, 1970.
9. Veterans Administration Cooperative Study Group on anti-hypertensive agents: effects of treatment on morbidity in hypertension. II. Results in patients with diastolic blood pressure averaging 90 through 114 mm Hg. *JAMA* 213:1143, 1970.
10. Jenkins CD, Rosenman RH and Zyzanski SJ: Cigarette smoking. Its relationship to coronary heart disease and related risk factors in the Western Collaborative Group Study. *Circulation* 38:1140, 1968.
11. Auerback O, Hammond C and Garfinkel L: Smoking in relation to atherosclerosis of the coronary arteries. *N Engl J Med* 273:775, 1965.
12. The University Group Diabetes Program: A study of the effects of hypoglycemic agents on vascular complications in patients with adult-onset diabetes. *Diabetes* 19 (Suppl. 2):747, 1970.
13. Paffenbarger RS, Jr; Laughlin ME, Gima AS and Black RA: Work activity of longshoremen as related to death from coronary heart disease and stroke. *N Engl J Med* 282:1109, 1970.
14. Cooper KH and Zechner A: Physical fitness in United States and Austrian military personnel. *JAMA* 215:931, 1971.
15. Walker WJ and Gregoratos G: Myocardial infarction in young men. *Am J Cardiol* 19:339, 1967.
16. Friedman M, Byers SO, Roseman RH and Elevitch FR: Coronary-prone individuals (type A behavior pattern). Some biochemical characteristics. *JAMA* 212:1030, 1970.
17. Likoff W and Moyer JH (eds): *Coronary Heart Disease*. Grune & Stratton, New York, 1963.
18. Hagan AD and Trone JN: Disqualifying cardiovascular disease in Navy and Marine Corps recruits. *Milit Med* 133:896, 1968.
19. Cooper KH: A means of assessing maximal oxygen intake: correlation between field and treadmill testing. *JAMA* 203:201, 1968. 🍀



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Malignant Hyperpyrexia in a Three-Year-Old Girl: Report of a Case

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INTRODUCTION

Malignant hyperpyrexia is an uncommon condition of unknown etiology that has greatly concerned anesthesiologists in recent years. Affected patients generally develop a rise in temperature shortly after induction of anesthesia.¹ A number of anesthetic agents currently in use have been implicated in the pathogenesis of malignant hyperpyrexia; possible exceptions are encountered in regional anesthesia, balanced anesthesia and neurolept anesthesia.² In a number of cases the intravenous injection of succinylcholine has been followed by vigorous fasciculations and contracture of skeletal musculature, posing difficulties at times in intubation.³ In some cases, such as the one now under consideration, no muscle relaxants were used; yet hyperpyrexia followed induction of anesthesia.⁴

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The opinions or assertions expressed in the above article are those of the authors and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

Despite efforts to cool the patient and correct the metabolic derangements the mortality remains very high, about 70%.² Until the pathogenesis and etiology of this condition are clarified, there is little hope of reducing the high death rate.

Zsigmond et al. recently have reported on the elevated serum-creatine phosphokinase activity in a family with malignant hyperpyrexia.⁵ From the results of their work, measurement of creatine-phosphokinase (CPK) levels may prove to be a useful screening test for detecting those who may be susceptible to development of malignant hyperpyrexia. A patient, in the family which they studied, presented a prior history of development of malignant hyperpyrexia and demonstrated abnormally high serum and muscle CPK activity. Elevated CPK activity was also found in the sera of the patient's children and five of his relatives.

CASE REPORT

A three-year-old girl was admitted to Naval Hospital Great Lakes, Ill., on 14 May 1972, with a diagnosis of neurogenic bladder. The patient was born with a

myelomeningocele involving the lower lumbar and upper sacral region of the vertebral canal. She presented paresis of both lower extremities and the left arm, and had bladder and bowel incontinence. She did not present any evidence of hydrocephalus, was of normal intelligence and was able to walk with the aid of braces and crutches.

At the age of three days, she had undergone general anesthesia for repair of the myelomeningocele. The agents used at that time were not known to the family. Temperature on admission was 99.2°F., weight was 11kg (24 pounds), and she appeared to be in good general health at the time of the preanesthetic visit except for her paresis. Blood studies on admission were within normal limits. Hemoglobin was 12.2 gm/100 ml and hematocrit was 38 vol %.

On 16 May the patient was brought to the Operating Room for the construction of an ileal conduit. She was premedicated with 0.2 mgm atropine and 40 mgm Nembutal. Her temperature on arrival was 98.6°F. Induction of anesthesia was accomplished with nitrous oxide (N₂O), 3 liters/min; oxygen (O₂), 2 liters/min; and halothane, 1% to 2%. The pulse rate at the start was 120 beats per minute, increasing to 160 beats per minute with excitement. After the patient was asleep, an intravenous infusion of 5% dextrose -1/3 normal saline solution was begun using a 20-gauge Longdwell catheter. It was a very uneventful induction and after approximately six minutes, the patient was intubated with a 5.5 uncuffed endotracheal tube. The intubation was atraumatic and the patient maintained spontaneous respirations throughout. Pulse rate at this time was 160 beats per minute and the concentration of halothane was increased to 2%. The abdomen was prepared and a temperature probe was inserted into the rectum. The patient was draped and it was noted that her temperature was 102°F. The surgeons were asked not to make their incision, halothane and N₂O were discontinued and the patient was hyperventilated with oxygenate, 6 liters/min. It was decided to postpone surgery and cooling was begun immediately with ice and alcohol bath. Ten cc (8.92 mEq) of sodium bicarbonate was administered while blood was drawn for CPK and blood gases. Pulse at this time continued to measure 160 beats per minute and body temperature remained at 102°F. At no time did the patient exhibit muscular rigidity or cyanosis.

After approximately 20 minutes of cooling, the temperature dropped to 101°F. The patient was awake and crying, and her temperature subsequently fell to 99°F. She was moved to the Intensive Care Unit where her vital signs remained normal, pulse rate was 144 beats per minute and temperature was 99°F.

The results of blood gas studies included the following: PaCO₂, 45 mm Hg; pH, 7.38 units; PaO₂, 119 mm Hg, and; oxygen saturation, 98.1%. CPK was 214 International Units.*

The patient remained in the hospital for two days. The remainder of the hospital course proved uneventful and she was then discharged to her parents' care.

DISCUSSION

There are two interesting aspects of this case: first, this young lady received no muscle relaxant drugs; second, she did not develop muscle rigidity.

One day following the untoward episode, the patient's CPK value was 381 International Units. Her father's CPK test was 112 International Units, which may indicate that he is also susceptible to the development of malignant hyperpyrexia; the mother's CPK test was reported to be 32 International Units. The patient has three brothers, and CPK determinations will be obtained for each of them, if possible, in further study of CPK isoenzyme patterns in this family.

When this young lady returns for surgery, a combination of local anesthesia and ketamine has been proposed for anesthetic management. In addition we will be prepared to institute immediate cooling should temperature elevation occur. It has been reported by several observers that large doses of procainamide (Pro-nestyl) have produced profound temperature falls in addition to correcting arrhythmias.⁶

While the pathogenesis and etiology of malignant hyperpyrexia remain unclear, it is apparent that survival depends on three clinical maneuvers: immediate discontinuance of anesthesia and surgery, prompt institution of cooling procedures and correction of metabolic derangements.

REFERENCES

1. Denborough MA and Lowell RRH: Anaesthetic deaths in a family. *Lancet* 2:45, 1960.
2. Britt BA, Locher WG and Kalow W: Hereditary aspects of malignant hyperthermia. *Can Anaesth Soc J* 16:89-98, 1969.
3. Thut WH and Davenport HT: Hyperpyrexia associated with succinylcholine-induced muscle rigidity: a case report. *Can Anaesth Soc J* 13:419-424, 1966.
4. Britt BA and Kalow W: Hyper-rigidity and hyperthermia associated with anesthesia. *Ann NY Acad Sci* 151:947-958, 1968.

*Normal range for serum creatine phosphokinase in our laboratory is 20-90 International Units.

5. Zsigmond EK, Starkweather WH, Duboff GS and Flynn K: Elevated serum-creatine phosphokinase activity in a family with malignant hyperpyrexia. *Anesth Analg* 51:220-225, 1972.

6. Beldaus J, Small V, Cooper DA, et al: Postoperative malignant hyperthermia: a case report. *Can Anaesth Soc J* 18:202-212, 1971.

ADDENDUM TO CASE REPORT

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Follow-up studies revealed slightly increased serum CPK levels in the patient's father, one paternal aunt, and one of three male siblings. The implications of these data were fully explained to the patient's family.

On 7 Sept 1972, our three-year-old patient was again brought to the Operating Room for the planned Bricker procedure. She had received 0.2 mg atropine

preoperatively.

After the availability of all the necessary precautionary measures was ensured, anesthesia was induced with 100 mg ketamine intramuscularly, followed by another 50-mg intravenous dose. Maintenance was accomplished with N₂O-O₂ in a non-rebreathing system, and small intravenous doses of curare, as needed, for muscle relaxation. An endotracheal tube was placed without difficulty. Monitoring was continued through the use of blood pressure cuff, precordial stethoscope ECG, tympanic temperature and esophageal temperature probes, nasogastric tube and cooling blanket.

Three hours into the procedure, the temperature had increased from 98.4°F. to 100.5°F. At this point, cooling measures were instituted, including gastric lavage with an iced solution of 5% dextrose and Ringer's lactate. Within 30 minutes the temperature declined to 99°, where it remained for the rest of the five-hour procedure. At no point did the temperature ever exceed 100.5°F. Curarization was reversed with atropine - Prostigmin, and the patient had an uneventful postanesthetic recovery, to the great professional satisfaction of involved staff members. 🍀

TRI-SERVICE MEETING — Army and Air Force representatives visited the Navy in Pensacola on 30 August to discuss facilities utilization under the Tri-service South-eastern military medical regionalization concept. Conferees, seated from left to right are: Army Medical Corps COL A.B. Peyton, Fort Gordon, Ga., Regional Coordinator for South Carolina, Georgia, Florida and Alabama; his Administrator, COL A.L. Correa, MSC, USA; and RADM Oscar Gray Jr., Commanding Officer, Naval Aerospace and Re-



gional Medical Center (NARMC), Coordinator for the Naval sub-region. Standing, from left to right are: COL R.C. Templeton, MSC, USAF, Maxwell Air Force Base Hospital Administrator; CAPT Robert M. Ware, Executive Assistant to RADM Gray; CAPT Neil V. White, MC, USN, Commanding Officer, Pensacola Naval Hospital; and CAPT Richard L. Lawrence, MC, USN, NARMC Special Assistant for Professional Services.—PAO, NARMC, Pensacola, Fla. 🍀

A Modified Unit-Dose Medication System for Military Hospitals

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During 1967 the Pharmacy Service at the Naval Hospital, Philadelphia, began to ponder the possibilities of instituting some changes in the traditional floor-stock drug distribution system which has existed in military hospitals for so many years. We felt the system was in need of improvement.

DISADVANTAGES OF FLOOR-STOCK SYSTEM

Excessive variety and quantity of drugs.

One of the reasons why we felt improvements could be made in the existing system is graphically shown in Figure 1. Four wards were selected at random. The contents of the drug lockers on these wards were inventoried and medication cards were checked to determine the number of medications actually dispensed. Figure 1 indicates that approximately 12% of the drugs on the wards were actually used on that particular day. The

data indicate that the floor-stock system lends itself to the stocking of excessive variety, as well as excessive quantity, of drugs.

Ward	Number of Drugs in Ward Locker	Cost	Number of Drugs in Use that Day
A	204	\$ 372.86	27
B	215	528.64	30
C	293	646.06	31
D	348	1,343.22	28

Figure 1.—Drug locker inventory results on four 35-bed wards (selected at random) using traditional floor-stock drug distribution system.

Pilferage.

It was considered that retention of such large stocks of drugs on each of the wards in our hospital invited pilferage. At the time, as was probably true to a greater or lesser degree in most hospitals, a significant increase in drug abuse cases was observed among staff and patient personnel. Our Naval Investigative Service determined that, in most instances, staff personnel who

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were admitted to the hospital with a diagnosis of drug ingestion had obtained the drug by pilferage from ward medicine lockers.

Ward medical officers are frequently encouraged to sign forms which they have not carefully read. It is not difficult for ward personnel to add items not actually required on the ward, to a drug order.

Medication errors.

Medication errors may well be anticipated in the floor-stock system, wherein personnel not specifically trained to interpret doctors' medication orders are, in fact, the primary staff to implement those orders, from original interpretation to actual administration. The general duty hospital corpsman who is most frequently assigned to duty on a ward, has just recently finished Basic Hospital Corps School, in most instances, and is completely inexperienced. Many of our nurses have also recently finished their training and have had only minimum experience. Outpatient prescriptions on the other hand are filled by pharmacists, or pharmacy technicians who have received nine months of formal education in addition to Basic Hospital Corps School and ward experience.

The military services have for many years recognized the necessity for pharmacy personnel to receive advanced training in order to correctly interpret and fill doctors' medication orders which have been written on a prescription blank for an outpatient. Furthermore, technicians who serve in our hospital pharmacies, are supervised by commissioned pharmacists. But the ward personnel who read, interpret and apply medication orders written on an order sheet for a hospitalized patient, have not received this training.

NEW SYSTEM DEVELOPED

In an effort to develop a method for distributing drugs to wards which might correct some of the disadvantages of the floor stock and, equally as important, in an attempt to reduce the amount of time-consuming paperwork required of ward personnel in carrying out all "medication maneuvers," the Pharmacy and Nursing Services felt the need to join forces. In that spirit, a protocol for a jointly-developed system was written.

A study was conducted on five wards (cardiopulmonary, orthopedic, neuropsychiatric, female surgery and postpartum) totaling approximately 175 beds, for a period of 19 months.

Ward drug cabinets were replaced with medication carts; each patient was assigned a specific drawer for his medications. (See Figure 2)

Satellite pharmacies consisting of a drug cabinet, steel locker, or closet, were established. Satellite pharmacies each contained a complete stock of those medications normally used on the ward, prepackaged in seven-day quantities, and prelabeled with: generic and trade names, strength, and lot number.

Since the Vietnam conflict was at its height and domestic manning levels were low, it was feared that the personnel requirements for achieving a strictly enforced unit-dose medication system could not be met by our hospital at that time. Accordingly, we settled for a modified system wherein all drugs were prepackaged in seven-day quantities, based on recommended average dosage for tablets and capsules, respectively.

For example, we prepackaged seven 100 mg secobarbital capsules per container; 250 mg tetracycline tablets were packaged in lots of 28 (1 q.i.d. x 7 days). We found two-ounce bottles of liquid preparations to be satisfactory in most cases. Every effort was made to utilize single-dose ampules, vice multi-dose vials throughout the supply system, whenever possible.

A two-page, no carbon required, doctor's order sheet was devised. A copy of the standard form (SF) 508a (Doctor's Order Sheet) serves as the front page. The back page is perforated on every fifth line. The patient's addressograph plate is used to stamp the back of each five-line section, for identification purposes.

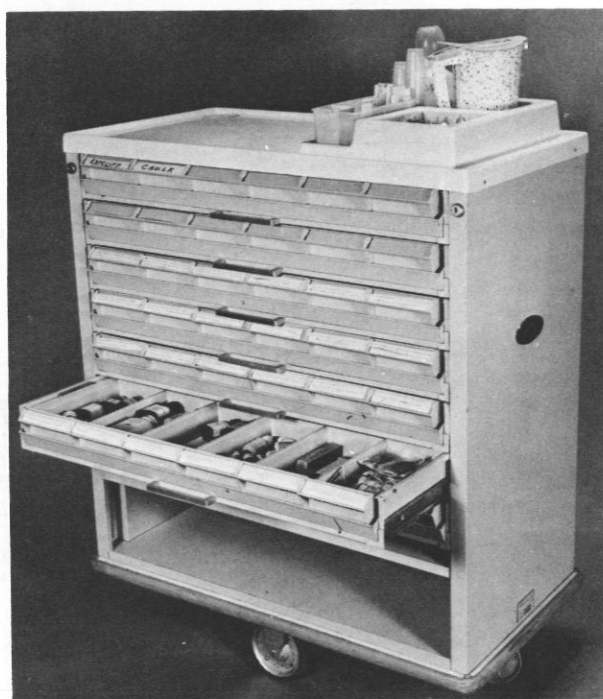


Figure 2.—The Brewer Medication Cart. A drawer is assigned to each patient on the ward and all of his medications are kept in his own drawer. The small amount of "ancillary" stock is also maintained on the cart.

PROCEDURE

Medical officers wrote orders in the same manner as before, but utilized the new doctor's order sheet.

Nursing personnel detached the appropriate small portion of the second page of the order sheet, placing it in a drawer marked "MED ORDERS." They also made necessary changes (i.e. additions, deletions, or modifications) to the medication administration record. (See Figure 3)

At specified intervals a pharmacist visited the ward, removing any new, and/or refill orders from the satellite for filling. When orders to discontinue medications

were found, the pharmacist removed the medications from the cart.

A supply of certain items which are used routinely on several patients, such as isopropyl alcohol, 70% Betadine solution, and aspirin, was maintained on the ward. A few vials of drugs which might be termed "ancillary" items were also maintained on the cart. Ancillary items might include such things as 20 million units of penicillin G for intravenous use, Solu-Cortef, ampicillin injection and Keflin. The emergency tray maintained on each ward was continued.

The Modified Unit-Dose Medication System, then, provided the following:

[illegible]

Figure 3.—The Brewer Medication Administration Record served to eliminate the Kardex and “med card” system, reducing to a minimum the time required to chart medications. Previously, ward personnel had to transcribe doctors’ orders to the medication Kardex and “med cards,” and chart the medications administered in the nursing notes (SF 510).

1. A new medication administration record which replaced the small "med card" and which permitted a much faster method of charting medications,
2. A separate drawer for each patient's medications, and
3. Medication orders that were interpreted and filled by a pharmacist.

RESULTS

The data collected supported the hypothesis that the new system would permit significant reductions in ward drug inventories (Figures 4 and 5). Figure 4 summarizes the results of an inventory conducted on drug lockers of the five wards while using the floor stock system. Figure 5 indicates the results of an inventory conducted on the same five wards one day after the new unit-dose medication system was instituted. The inventories reveal a 91.8% reduction in dollar value and an 84% reduction in the number of drugs on the ward under the new system.

FLOOR-STOCK SYSTEM

Ward	Cost of Drugs	Number of Drugs
A	\$515.85	221
B	288.95	136
C	627.09	253
D	291.28	171
E	209.81	112
Average: \$386.59		179

Figure 4.—Drug locker inventory results on five wards studied one day prior to implementing the Modified Unit-Dose Medication System.

MODIFIED UNIT-DOSE SYSTEM

Ward	Cost of Drugs	Number of Drugs
A	\$12.25	43
B	42.92	22
C	24.82	32
D	4.16	13
E	76.37	29
Average: \$32.10		28

Figure 5.—Drug locker inventory results on the same five wards (as in Figure 4) studied one day after the unit-dose medication system was implemented.

No significant differences in the cost of the drugs delivered to the wards under the two systems were detected. Consequently, our findings do not suggest a reduction in pilferage. However, for all practical purposes, it is impossible to detect pilferage solely by demonstrating differences in ward drug costs. For example, during the 30 days prior to the implementation of the new system (i.e. while still using the floor-stock system), one ward ordered and received from the pharmacy 617 100-mg secobarbital capsules. Cost to the government was \$3.08. During the following 30 days, under the new system, 253 secobarbital capsules, at a cost of \$1.25, were delivered to the ward. We considered that a 59% reduction in the quantity of secobarbital capsules issued to one 35-bed ward during a 30-day period was very significant. However, the 59% reduction in quantity resulted in a saving of only \$1.83. It is quite possible that the 364 secobarbital capsules are of far greater significance than the \$1.83 price tag would indicate.

No measurable differences in the frequency of errors made under the two systems were observed. During the period of time in which data were being collected, three errors were reported on the control (i.e. floor-stock) wards and one error was reported on the wards using the modified unit-dose system. This was not considered significant, since both the reporting and the detection of medication errors are extremely difficult and unreliable. However, the 187 medication errors reported in our hospital during the previous year were reviewed and further analysis of these suggested that approximately 25% of the errors could not have occurred had the new system of drug distribution been in effect. With the new system nursing personnel are still required to read, interpret the doctor's order and select the proper medication, just as they have always done. The only medications from which nursing personnel can choose, however, are those which a pharmacist has placed in that patient's drawer, after having read and interpreted the doctor's handwritten order.

Collected data revealed that 35.5% less time was required for all "medication maneuvers" under the new system. This supported the expectation that the time required of nursing personnel to administer and chart medications, and order drugs from the pharmacy, would be substantially reduced.

PROBLEMS OF UNIT-DOSE MEDICATION SYSTEM

Two primary problems were presented by the modified unit-dose medication system. In brief, these are as follows.

1. Medication administration records are maintained in a Kardex file on the drug cart, rather than in

the patient's chart. Consequently, when the medical officer is at the patient's bedside, information as to whether a specific medication was administered to his patient at a specific time is not readily available to him. Various hospitals have resorted to various means of correcting this inconvenience, but it is this writer's opinion that no really suitable solution to the problem has as yet been devised.

2. A significant increase in staffing of the pharmacy would be required in order to implement the system throughout the hospital.

CONCLUSION

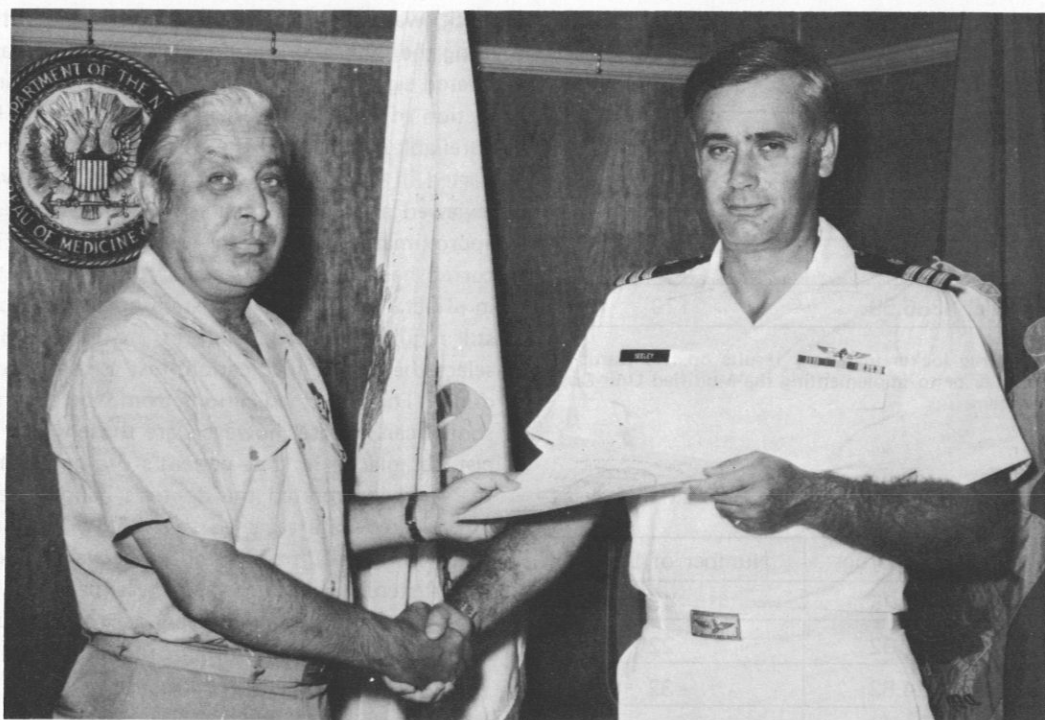
The response of nursing personnel to implementation of a modified unit-dose medication system designed for study at the Naval Hospital Philadelphia, was excellent.

We were unable to prove conclusively that the system did cause a reduction in medication errors or pilferage, but the difficulty in accurately measuring the extent of these two problems must be overcome.

Unfortunately neither pilferage nor medication errors can be completely eliminated by a particular drug distribution system, alone.

The study proved conclusively that ward drug inventories can be reduced. It was also shown that the time required for all "medication maneuvers" (i.e. ordering and receiving drugs from the pharmacy, transcribing medication orders to the "med card," pouring, administering and charting) on the ward is significantly reduced when the modified unit-dose medication system is utilized.

One important aspect of the modified unit-dose medication system that is often overlooked is the improved patient care which can be attained by allowing the pharmacist to do that for which he alone is properly trained, to: interpret the medical officer's handwritten medication order, make a well-informed decision as to whether the patient's interests would be served best by checking the order further with the medical officer, and dispense the medication which the physician desires for his patient. 🍀



TWO-YEAR RESIDENCY COMPLETED — CDR Richard Seeley, MC, USN (right) received congratulations from CAPT Robert C. McDonough, MC, USN (left), Commanding Officer, Naval Aerospace Medical Institute, Pensacola, and a certificate indicating completion of two years of residency training in aerospace medicine at the Institute. Dr. Seeley is a captain selectee and is scheduled to attend Tulane University for a Public Health and Tropical Medicine course.—PAO, Naval Aerospace Medical Center, Pensacola, Fla. 🍀



ACDUTRA

The Director of the Naval Reserve Division, BUMED is often contacted by reservists who desire "something different for active duty for training (ACDUTRA) this year."

A source of assistance to the individual reservist in planning the unusual tour of ACDUTRA is the CATALOG FOR ACTIVE DUTY FOR TRAINING FOR NAVAL RESERVE PERSONNEL, NAVPERS 15954, a copy of which is available at all Naval Reserve Centers and Naval District Headquarters. A new catalog is published each spring and promulgates ACDUTRA offerings for the subsequent fiscal year. Changes to the catalog are usually published in December of each year.

Section "N" of the catalog describes Medical Department training available to eligible officer and enlisted reservists. Portions of this publication which are often overlooked by members of the Medical Department are Sections "C" and "D," Seminars, and Amphibious Training, respectively. Each section lists courses which are not only of interest to a large segment of the reserve medical community, but pertinent to various mobilization assignments, as well as career-enhancing.

Not to be overlooked in planning, is the District Medical Program Officer who is as near as the telephone. He also often has information concerning unique and meaningful ACDUTRA.

A secondary concern when discussing ACDUTRA is what kind of pattern it should have. There is no prescribed pattern. However, a reservist would probably do well to seek variety in an effort to achieve a well-rounded exposure to the active duty establishment. A plan which can provide such exposure in a four-year cycle is: hospital duty, operational duty (e.g. sea, FMF, small dispensary), mobilization billet or similar

station, and formal course of instruction; then repeat the cycle.

Some reservists prefer ACDUTRA at the same activity annually, usually because they have made local arrangements to relieve members of the hospital staffs during regular leave periods.

Selection Boards might question the reasons for such repetitive duty, and the fact that it is being done for contributory support reasons should be clearly spelled-out in the ACDUTRA fitness reports. Medical members of certain functional reserve units, such as Construction Battalions, take training duty with their units every year; the reason for such duty is obvious and does not call for amplification.

Whatever the type or pattern, the secret is consistency — that is, to take ACDUTRA every year, with or without pay.—Code 36, BUMED. ☛

SHAKING AUTO SHOCKS

Shaking "shocks" are making millions of drivers ill without them knowing why, says a report issued in Britain following more than three years of study by a team of engineering and medical experts.

According to the Public Service Division of British Leyland Motors Canada Limited, the team was appointed by the Shock Absorber Manufacturers Association—whose members make shock absorbers for a vast range of European cars—to discover the true effects of driving with worn-out "shocks."

The team reports that overworn shock absorbers can cause a car to vibrate in a way that the driver is quite unaware of. This vibration can cause headaches; deafness; it can affect a motorist's sight; or simply rock him to sleep at the wheel.

Scores of unexplained highway death crashes may have been caused by the drivers being shaken to sleep, says the report, which states:

"Expert medical opinion from a consultant in motor-ing medicine concerning the long-term effects on both drivers and passengers in vehicles with inadequate 'shocks' is both surprising and alarming.

"Cars with worn out shock absorbers—about one-in-three in Britain—subject their occupants to an excessively pitching and yawing ride and also to undetectable vibrations.

"The combination of these three disturbances has strange and possibly dangerous effects due to the three-dimensional motion.

"The build-up of the 3-D motion could start with a motorist having to tense himself, unconsciously, against the bumps and vibrations, and this leads to headaches, aching limbs and irritability.

"Also, the vibrations can lead to severe upset of vision, even possibly double vision, and the end result is a prematurely fatigued driver behaving in an aggressive manner.

"Such behavior is frequently alien to his normal character as he himself is unaware of the change. Not realizing how tired he really is and with eyes playing tricks on him he is likely to become drowsy, fall asleep at the wheel or momentarily lose control of the car."

Sufferers from illnesses which cause giddiness, vertigo and nausea could have an attack induced by persistently riding or driving in an ineffectively dampened vehicle.

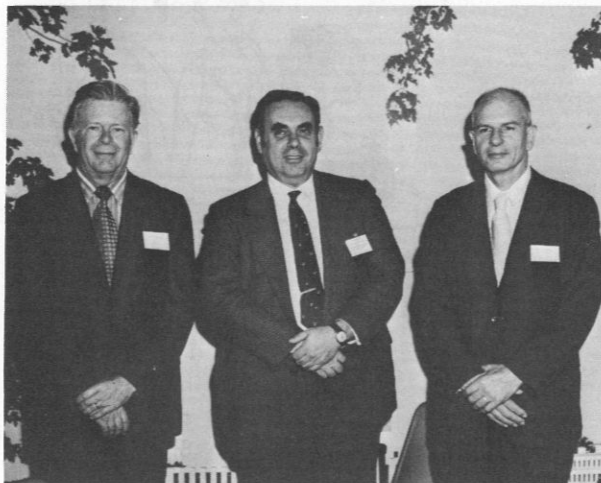
Even blame for severe backache and slipped disc conditions can be traced to the same source, adds the shock report.—AFPS, Washington, D.C. 🍀

COMMUNICABLE DISEASES WORKSHOP

A joint Technical Workshop on Communicable Diseases was held at Bethesda, Md., 25-28 Sept 1972, under the sponsorship of BUMED and the Office of Naval Research. Dr. Samuel Koslov, Special Assistant for Science to the Assistant Secretary of the Navy (Research and Development), gave the introductory address to the Technical Workshop. CAPT Lloyd F. MILLER, MC, USN, Director, Research Division, BUMED, formally initiated the Communicable Diseases Workshop with an overview of problem areas.

Representatives from operational forces within the U.S. Fleet and Marine Corps, Army, Air Force and from various areas of biomedical scientific interest at other government agencies and universities attended. The workshop participants were assigned to subcom-

mittees on acute respiratory diseases, bacterial infections, parasitic diseases, virus and rickettsial diseases, skin infections and mycoses, and the reporting of communicable diseases.



COMMUNICABLE DISEASES WORKSHOP—Dr. Samuel Koslov (center), Special Assistant for Science to the Assistant Secretary of the Navy (Research and Development) gave the introductory address. Active participants were: CAPT L.F. Miller, MC, USN (left) and CAPT Joseph P. Pollard, MC, USN, (Ret) (right), Director of Biological & Medical Sciences Div., Office of Naval Research.

The purpose of the Navy's communicable disease program is directed toward meeting the operational requirements of the armed forces. This workshop was organized to assess the responsiveness to current requirements and to define the direction to be taken in the performance of future research on the prevention, control, and treatment of communicable diseases of military importance.

CAPT Herbert G. ARM, MSC, USN, Research Division, BUMED, and Dr. Arthur Emery, Jr., Office of Naval Research, were joint coordinators of the Technical Workshop on Communicable Diseases. 🍀

NEW FIRM AIDS CHAMPUS

Colorado Dental Services, Inc., has begun processing claims for dental care received under the CHAMPUS Basic Program.

The firm, which began processing dental claims under the Program for the Handicapped a year ago, recently moved to new offices at 1634 Downing St., Denver, Colo. 80218. Officials of the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS) indicate that dentists should now submit all claims for care provided to that address.

CHAMPUS officials also add that the move was precipitated by an ever-increasing workload of claims and is expected to delay the processing of claims temporarily. They have asked for patience until the system is running smoothly again.

Inquiries about the status of claims should also be referred to the Downing Street Office. The initial application for benefits under the Program for the Handicapped, however, should be sent (CHAMPUS Form 161) to the CHAMPUS office, Denver, Colorado 80240. ☘

CHAMPUS CERTIFICATES DUE

CHAMPUS claims are often rejected, according to COL Edward V. Allen, Director of Contract Management for the comprehensive hospital and medical health benefits program, because beneficiaries have not met the deductible requirement for outpatient care under the cost-sharing provisions of CHAMPUS.

"With a new fiscal year beginning July 1," COL Allen says, "beneficiaries of the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS) must obtain their new annual outpatient deductible certificates before the government can share in the payment for outpatient health care received from civilian sources."

Annual deductible certificates are issued by the various CHAMPUS fiscal administrators in each of the states, Washington, D.C., Canada, Puerto Rico and Mexico, upon receiving properly-completed claim forms and itemized bills or receipts for authorized health care and services.

The deductible amounts to the first \$50 of outpatient health care received each fiscal year, when one family member received care. If benefits are claimed for two or more members of a family, the maximum deductible charge is \$100 per family group each fiscal year.

After the deductible requirement is met, dependents of active duty personnel then pay 20% of the allowable charges for outpatient care; retirees, their dependents and dependents of deceased active duty and retired personnel pay 25% of the allowable charges. ☘

CHAMPUS IDENTIFICATION

A valid identification card is proof of eligibility for care under the Uniformed Services Health Benefits Program. The identification card for all dependents of active duty, retired and deceased personnel is DD form 1173, Uniformed Services Identification and Privilege

Card. For retirees it is the gray-colored DD Form 2 (Ret), except that for retired members of the Commissioned Corps of the Public Health Service it is the gray colored Form PHS-1866-3 (Ret).

Normally cards are not issued to children under 10 years of age. Certification and identification of such children is the responsibility of the accompanying parent. However, identification cards should be issued to children under 10 who must be separated from a parent for extended periods or whose parents are divorced and the children are residing apart from the service member.—Health Benefits Counselor Bulletin 10-72, BUMED. ☘

PRIMARY PHYSICIANS AT PENSACOLA

CAPT Neil V. White, Commanding Officer, Pensacola Naval Hospital, is pleased to announce that the Family Practice Residency Training Program has been approved and that the Family Practice Clinic is now staffed with American Board-certified specialists.

Navy Medical Corps CDR George C. Bingham, LT Timothy F. Harrington, and LT John A. Zapp have been notified of their successful completion of all requirements and are now Diplomates of the Board of the American Academy of Family Practice. CDR Bingham is the director of the clinic.

The clinic serves approximately 660 families or a total of about 2600 people at this time and is expected to be enlarged as additional physicians are assigned. One of the main aims of this clinic is quality in-depth medical care under an ongoing program emphasizing continuity of patient care. Records of patients are kept in the clinic and maintained in the problem-oriented format.

Military sponsors participating in the program, and each of their dependents, all have their individual health problems treated by the same physician. If their doctor determines that he needs to consult other faculty members, or refer the patient, he will do so. "Every specialist and every other physician on my staff will be available to help the primary physician," CAPT White said.

Doctor Bingham is pleased to be the first director of the new model family practice unit with full AMA approval.

Maintaining contact with other military hospitals where family practice residency programs have been established, CDR Bingham learned that the response of patients has been overwhelming. He commented, "The patients feel at home with their physicians,



CDR George C. Bingham, MC, USN



LT Timothy F. Harrington, MC, USNR

knowing they have doctors taking care of their families that can understand the human interactions that affect one or more of the members of the family unit."

Jacksonville has the first Family Practice Clinic in the Navy.

RADM Oscar Gray Jr., MC, USN heads the newly formed Regional Medical Center at Pensacola, directing the activities of: medical dispensaries at NAS Pensacola, NAS Saufley Field, NAS Ellyson Field, NAS Whiting Field and the Naval Communications Training Center; Naval Hospital Pensacola; Naval Aerospace Medical Center and Institute, and the Naval Aerospace Medical Research Laboratory.—PAO, Naval Aerospace Medical Center, Pensacola, Fla. 🇺🇸



LT John A. Zapp, MC, USNR

OFFICIAL INSTRUCTIONS AND DIRECTIVES

FM SECNAV TO ALNAV (63)

Subj: Survivor Benefit Plan for Uniformed Services Retirees

1. On 21 Sep 72, the President signed into law a bill providing a Survivor Benefit Plan (SBP) for uniformed services retirees. The term retiree hereinafter includes Fleet Reservists and Fleet Marine Corps Reservists. The term retired pay includes retainer pay. This law replaces the Retired Serviceman's Family Protection Plan (RSFPP) for all personnel who initially become entitled to retired pay on or after 21 Sep 72. This message describes the major provisions of this new plan.
2. The major provisions of the new SBP as they apply to active duty personnel are:
 - a. All elections under RSFPP by personnel who initially become entitled to retired pay on or after 21 Sep 72 are null and void.
 - b. All military members who have a spouse or dependent children on the date of retirement are automatically covered by the SBP at the maximum annuity level unless they elect not to participate or to participate at a lesser level. If coverage is declined for a spouse at the time of retirement, this decision is irrevocable and coverage for a spouse cannot be provided at any later point in time.
 - c. Unless the member specifies to the contrary the following coverage will be provided under SBP:
 - (1) A member with a spouse only will be provided annuity coverage for the spouse.
 - (2) A member with a spouse and dependent children will be provided coverage for the spouse and children unless he chooses to cover the spouse only, or the children only. An election to cover the spouse only will not necessarily exclude coverage for the children later. Coverage for the children can be added at a later date provided an additional child or children are acquired subsequent to the initial election. An election to cover the children only, when there is an eligible spouse at the time of election, acts to prohibit forever coverage for the present spouse or for any future spouse. Coverage for children only, where there is an otherwise eligible spouse, should be considered very carefully.
 - (3) A member with dependent children only will be provided coverage for the children.
 - d. A member who is not married and who does not have a dependent child or children at the time of retirement may elect to provide an annuity from his retired pay for a natural person with an insurable interest in the member. A natural person with an insur-

able interest can be anyone who could reasonably expect to receive some kind of financial benefit from the continuance of the life of the retiring member.

e. Base amount: Both the cost to the member and the amount of annuity payable under the SBP are based on all or a portion of retired pay called the "base amount." Unless the member elects to participate at a lesser level, the "base amount" is automatically the full retired pay. The member may elect to participate at a lesser level by designating a "base amount" that is less than full retired pay, but not less than \$300 a month. In cases where the full retired pay is less than \$300 a month the full retired pay must be used as the "base amount."

f. Cost.

(1) Monthly cost of an annuity for a spouse only is 2.5% of the first \$300 of the "base amount," plus 10% of everything over \$300 of the "base amount." (Example: Base amount equals \$400. Cost equals 2.5% of \$300 [\$7.50] plus 10% of \$100 [\$10] equals \$17.50 total cost; this will provide an annuity of \$220.)

(2) Monthly cost for an annuity for a spouse and dependent children is the same as for spouse only, plus an actuarial charge based on the difference between cost factors under RSFPP, Option One and Three. This additional cost factor will normally be less than 1% of the "base amount."

(3) The monthly cost for an annuity for dependent children only is based on the cost factors under RSFPP, Option Two. This cost will normally be less than 4% of the "base amount."

(4) The monthly cost to provide an annuity for a natural person with an insurable interest in the member is 10% of the member's full retired pay, plus an additional 5% of the member's full retired pay for each full five years that the named beneficiary is younger than the member. The total cost may not exceed 40% of the member's retired pay.

g. Annuity amount: The survivor annuity payable to a surviving spouse or child upon the death of a retiree covered by the SBP is 55% of the "base amount."

(1) When this annuity is payable to a widow it will be reduced by an amount equal to the amount of dependency and indemnity compensation (DIC) to which the widow is entitled, if any. Additionally, for widows over age 62, and widows under age 62 who have custody of one dependent child, the annuity will be reduced by the amount of widow's or mother's social security entitlement that is attributable solely to the member's military service. In most cases this will not equal the full social security benefit the widow will receive.

(2) When the annuity is payable to a child or children it will equal the full 55% of the "base amount" with no reduction because of DIC or social security benefits.

(3) An annuity payable to a natural person with an insurable interest will equal 55% of retired pay, after cost of participation has been deducted.

h. A member to whom the SBP would otherwise automatically apply at the maximum level (e.g., a married member, or an unmarried member with a dependent child, retiring on or after 21 Sep 72) may, prior to retirement elect not to participate in the SBP, to participate at a reduced "base amount," or elect to provide coverage for a spouse only or children only.

i. A member who makes no specific election prior to retirement and who comes under the automatic coverage provisions of the SBP, if retired within 180 days of 21 Sep 72, may elect not to participate in the SBP, elect to participate at a reduced "base amount," or elect to provide coverage for a spouse only or for children only. If he is not married and does not have a dependent child he may elect to provide coverage to a person with an insurable interest. This election must be made within 180 days of his date of entitlement to retired pay. This provision is made to preclude the necessity for making a hasty decision that cannot be reversed.

j. Pending availability of appropriate forms, an election not to participate in the SBP, or to participate at a reduced "base amount," or to elect coverage for a spouse only or for children only (where the member has both spouse and children) or to elect coverage for a natural person with an insurable interest may be made in a witnessed statement signed by the member which clearly sets forth the member's desires. Elections will be mailed, via the member's commanding officer, to the Marine Corps Finance Center (Retired Pay Division), Kansas City, or to the Navy Finance Center (Retired Pay Dept.), Cleveland, as appropriate. Elections submitted after retirement are effective on the first day of the month following receipt by the Finance Center.

3. Commanding officers will: Advise all personnel of the provisions of this SBP; Insure that personnel scheduled for retirement or transfer to the Fleet Reserve/Fleet Marine Corps Reserve within the next 180 days are individually counselled on the provisions of the SBP and are provided a personal copy of this message pending promulgation of more detailed information.

4. When a married member elects not to participate in the SBP or to participate at a reduced "base amount," or to participate on behalf of children only when there is an otherwise eligible spouse, the member's com-

manding officer will notify the member's spouse of this election and its effect. This notification, required by the governing law, will be by letter, enclosing a copy of this message pending promulgation of more appropriate material, and will be mailed to the member and his spouse by certified mail prior to the member's retirement date, when possible. A copy of the certified mail receipt will be filed in the member's record.

5. Members retired prior to 21 Sep 72 are not automatically covered under the SBP, but may elect to participate at any time before 21 Sep 73. All retirees are being provided information by direct mail, however, the death imminent status of some retirees makes immediate action mandatory. Commanding officers having knowledge of such retirees who are hospitalized or residing in the vicinity of their commands are to counsel such retirees concerning the SBP and if requested, assist the retirees in electing participation. The costs, annuities, and other details described herein are applicable to such retirees. Additionally, those currently in RSFPP may continue that participation, as well as participate in the SBP. Election to participate by such retirees should be in the form of a witnessed statement signed by the retiree which clearly states his desire to participate in the SBP and mailed to the Marine Corps Finance Center (Retired Pay Division), or the Navy Finance Center (Retired Pay Dept.), Cleveland. The election will be effective upon receipt and the cost of participation will be effective on the first day of the month following receipt. These elections should contain: Full identification of retired member, date of retirement, date of marriage, names, birth dates, and mailing addresses of spouse and dependent children. Do not delay submission of elections for all this information. When necessary to provide additional requested information for such retirees, telephone inquiries to HQMC, autovon 224-2371 or BUPERS, autovon 224-1238, are encouraged.

6. Implementing directives, information brochures, election forms, and additional pertinent material are in preparation and will be promulgated ASAP. Urgent questions with respect to the provisions of the SBP should be addressed to the Commandant of the Marine Corps (Code DN) or to the Chief of Naval Personnel (PERS-P5), as appropriate.

MANUAL OF THE MEDICAL DEPARTMENT

Change 76 of 2 Aug 72 (in part)

Chapter 15 - Physical Examinations

1. Art. 15-5(6) - Under habits, adds use of drugs that must be listed on SF 93 (Report of Medical History).

2. Modifies art. 15-12(2)(b)(2) on absence or loss of finger parts as causes for rejection.
3. Modifies art. 15-32(4), 15-39(2), 15-90(6)(d) and 16-44(1) to enable recording physical examinations on either the SF 88 or SF 600, whichever is more appropriate, and deletes requirement for recording examinations on both forms.
4. Adds art. 15-33, Special Duty, Intelligence Officers - deletes coverage in 15-69(4) as aviation physical examinations are no longer required for these officers.
5. Modifies art. 15-34(2) and 15-45(4)(a)(9) providing for the presence of a female attendant, vice nurse or female attendant, during physical examinations of women.
6. Revises art. 15-43 concerning physical examination procedures for candidates for service academies and the Naval Academy Preparatory School.
7. Art. 15-45A(5) - adds the requirement for an EKG in the annual physical examination of certain enlisted members.
8. Updates art. 15-59(7)(a) - is an aid for EKG reviewers at NAMI, NAVAEROREGMEDECEN; and (b) updates EKG reporting on naval air observers and air controllers.
9. Art. 15-62(2) is a clarification to examining flight surgeons of pertinent personal history items found to be disqualifying by the Advisory Council for Aerospace Medicine.
10. Art. 15-62(12)(a) - allows aviators who require distant vision correction to wear the same correction as a depth perception correction, if necessary, to meet Service Group I requirements.
11. Art. 15-62(16)(a), (b) and (c) - clarifies the present accommodation testing procedure and interpretation of those findings.
12. Art. 15-67(1)(e) - sets forth audiometric limits, at the 500 CPS level, for flight training candidates within the recommendation of current hearing conservation programs (see BUMEDINST 6260.6 series), and requires reporting of audiometric findings at the 4,000 CPS level, which are within the limits for appointment to commissioned grade.
13. Art. 15-69, 15-71, 15-73 and 15-79 - clarifies and

updates these articles and provides specific instruction to aviation examining facilities, due to the introduction of the "Master Medical Record" concept and the conversion of medical records of aviation personnel to microfilm form.

14. Revises Section VI of Chapter 15 to bring physical examination of reservists under a triennial/annual procedure similar to that for Regular officers.

Chapter 16 - Health Record

15. Art. 16-2(1)(b) - adds NAVMED 6120/2 and 3 to the contents of the Health Record.
16. Art. 16-13 and 16-52 - deletes "terminated" as the Health Record is now only closed, vice closed or terminated.
17. Art. 16-46 - revises physical examination entries to be made on SF 600.

BUMEDNOTE 6700 of 3 Oct 72

*Subj: 70mm X-ray units conversion
14" x 17" chest unit*

BUMEDNOTE 6700 of 11 Apr 72 directed reporting of 70mm X-ray units to BUMED for disposition since no immediate use was envisioned for them. Following liaison with the Bureau Radiologic Consultant and the Radiology Dept., Naval Hospital Philadelphia, a method of conversion of the 70mm X-ray units to take photo-timed chest X-rays has been developed.

The 70mm X-ray units may be converted to use a wall mounted cassette holder where work load is approximately 50 or less exposures per day, or may be modified to use the automated film transport systems of the Picker X-ray or DuPont Corporations in heavier workload situations. No additional room shielding is needed.

Modification procedures are contained in the basic notice and activities are authorized to convert 70mm X-ray units to 14" x 17" chest units as described therein. Units which are uneconomical to convert because of age or construction may be surveyed locally in accordance with current instructions. ☛

DRS. GRAYBIEL AND REASON

Dr. James T. Reason of the University of Leicester in England, visited with Dr. Ashton Graybiel at the Naval Aerospace Medical Research Laboratory, Pensacola, Fla., for a month during the late summer. They are writing reports on joint research in which they have collaborated, and conducted additional experiments

using one of the Laboratory's rotating rooms. The research investigators are studying possible effects people may encounter in a closed rotating environment, such as astronauts encounter, and the alleviation of long-term weightlessness problems.—PAO, Naval Aerospace and Regional Medical Center, Pensacola, Fla. ☛

AWARDS AND HONORS

Legion of Merit

CAPT Loy T. Brown, MC, USN
CAPT Dolores Troskoski, NC, USN

Bronze Star Medal

HMC Robert C. David, USN

Meritorious Service Medal

LT Michael F. Conway, MSC, USN
CAPT John J. Dempsey, MC, USN
RADM Philip O. Geib, MC, USN
CAPT Donald Tyson Lansinger, MC, USN
RADM Harry P. Mahin, MC, USN
RADM Frank T. Norris, MC, USN

Navy Commendation Medal

CAPT Robert L. Nolan, MC, USNR
LCDR James D. Schweitzer, MSC, USN
CAPT John T. Vincent, MC, USN

Navy Achievement Medal

HM1 Ignatius D. Balistrere, USN
HMC Alan H. Bennett, USN
HM2 Donald J. Collings, USN
HM2 James R. Cornell, USN
HN James A. Crawford, USN
HM3 Roy J. Flora, USN
HM3 Stephen D. Jones, USN
HM1 Walter S. Jordan, USN
HM1 Anthony B. Keen, USN
HM3 Kim S. Kleist, USN
HN Steven L. McCluney, USN
HM1 Gerald L. Metzger, USN
HN Carl P. Nedley II, USN
LCDR Norman K. Owens, MSC, USN
HMC Joseph G. Packard, USN
HMC Terrence L. Pangburn, USN
HM3 Jerry L. Smith, USN
HM1 William L. Townsell, USN

HMCS HEAGY LAUDED

For meritorious service to the President, both at Camp David and the White House Physician's Office over the past four years, HMCS Paul M. Heagy was awarded the Navy Commendation Medal. The award was bestowed for the President by his Military Assistant, BRIG GEN Brent Scowcroft, USAF.

Chief Heagy is now a member of the staff at Naval Hospital Jacksonville, Fla.—Courtesy of CAPT William M. Lukash, MC, USN; Office of The White House Physician, Washington, D.C.



HMCS P.M. Heagy, USN (right) receives the Navy Commendation Medal from BRIG GEN Brent Scowcroft, USAF (left), Military Assistant to the President.

AMERICAN BOARD CERTIFICATIONS

American Board of Anesthesiology

LCDR John S. Willens, MC, USNR

American Board of Family Practice

CDR George C. Bingham, MC, USN
LCDR Sylvain A. Borel, MC, USNR
LT John P. De Simone, MC, USNR
LT Timothy F. Harrington, MC, USNR
LCDR Ralph J. Mann, MC, USN
LCDR Willie G. Wyatt, MC, USN
LT John A. Zapp, III, MC, USNR

American Board of Internal Medicine

LT Keenan Frank Barber, MC, USN
LCDR Perry D. Holmes, MC, USNR
LCDR William E. Lawler, MC, USNR
LCDR Harry R. Maxon III, MC, USN
LCDR Hugh B. McCormick, MC, USN
CDR Ross B. Moquin, MC, USN
CDR Howard E. Shute, MC, USN
LCDR Kenneth M. Yamashiro, MC, USNR

American Board of Nuclear Medicine

CDR Peter T. Kirchner, MC, USN
CDR Robert E. Thompson, MC, USN
CDR Gordon John Weir, Jr., MC, USN
LCDR James W. Winebright, MC, USNR

American Board of Pathology

LCDR Robert G. Addison, MC, USN
LCDR Victor M. Alvarez, MC, USNR
LCDR Arthur L. Raines, MC, USNR

American Board of Pathology (Con.)

LCDR Antonio Tamara, MC, USN

American Board of Pediatrics

LCDR Frank L. Dwinnell, MC, USN
LCDR Thomas Lohner, MC, USN
LCDR Ralph I. Lopez, MC, USNR

American Board of Preventive Medicine in Aerospace Medicine

CDR James W. Brough, MC, USN
CDR Frank E. Dully, Jr., MC, USN
LCDR Lewis Mantel, MC, USN

American Board of Preventive Medicine in Occupational Medicine

CDR Mark E. Bradley, MC, USN
CDR Julio C. Rivera, MC, USN

American Board of Radiology

LCDR George N. Baldwin, MC, USNR
LCDR Frederic H. Gerber, MC, USN

American Board of Radiology in Diagnostic Radiology

LCDR Richard D. McLeary, MC, USNR

American Board of Surgery

LCDR Howard E. Braitman, MC, USNR
LCDR Francis J. Eason, MC, USN
LCDR Theodore Leon Folkerth, MC, USN
LCDR Howard H. Kaminsky, MC, USN
LCDR Gene L. Krishinger, MC, USNR

SHIPBOARD WASTE DISPOSAL

Scientists at the Naval Research Laboratory here are studying the diffusion of dissolved oxygen in wet-air oxidation processes for use in shipboard waste disposal.

The effects of this diffusion on process efficiency, analyzed for bubble column reactors, are important for the proper design of sewage treatment units using this wet-air oxidation process.

It is felt this study will give specific direction to chemical research which would be useful in gaining a better understanding of wet-air oxidation performance.—NAVNEWS, Washington, D.C.

OPERATION PEGASUS

DENTAL CARE

Ordinarily dependents stationed outside CONUS are eligible for routine dental care subject to the availability of space and facilities, and the capability of a professional staff at an overseas base.

Operation Pegasus — which transported 681 dependents to Athens, Greece — provided a new approach to dependent dental care. While Athens bound during the period 17 Aug - 4 Sept 1972, the U.S.S. *Puget Sound* (AD-38) Dental Department personnel prepared a permanent dental record, completed an oral examination and provided topical application of stannous fluoride for each dependent who was four years of age or older.

The following numbers of dental procedures were completed during the cruise, under the leadership of CDR R.R. Eklind, DC, USN:

- Examinations - 570
- Stannous fluoride application - 566
- Dental radiographs - 870
- Permanent restorations - 424
- Extractions - 119
- Plaque control instructions - 223
- Oral prophylaxes - 566
- Scalings - 198
- Permanent prosthetic appliances - 15
- Total procedures - 4193
- Total sittings - 1152

The Dental Department in U.S.S. *Puget Sound* (AD-38) will continue to offer dental care to dependents while the ship remains in Athens. The Commanding Officer is CAPT Orval K. Hallam, USN. 🇺🇸

DEPENDENT ID CARDS

Changes in the procedures for obtaining new or replacement ID cards by dependents of deployed Navy-men, or by retired service personnel, have been announced by BUPERS. In the past, application for ID cards had to be made directly to the naval activity holding the service member's official record. This caused a hardship for the dependents of deployed Navy-men, due to mail delays, or operational commitments. Under the new policy, eligible primary dependents (spouse and those children between 10 and 21 years of age) can apply to the nearest naval activity authorized to issue ID cards. The activity will contact the Bureau of Naval Personnel in Washington, by

phone or message, to verify the claimed dependency. In cases where dependency cannot be verified from the existing Bureau records, the issuing activity will request the verification from the deployed ship or unit by message. The BUPERS offices handling verification requests are: Officers, PERS E-241, autovon 224-2887, and Enlisted, PERS E-34, autovon 224-2254. Retirees needing new or replacement ID cards, for themselves or their primary dependents, no longer need to apply to the Naval Reserve Manpower Center in Bainbridge, Md. The recent change allows them to apply at their nearest naval activity. The activity issuing office can replace ID cards upon presentation of: the serviceman or woman's retirement orders; a marriage license, if application is being made for a lawful spouse; or a birth certificate if applying for an eligible child. The new policy is outlined in change 3 to BUPERS INST 1750.5D.— CHINFO Newsgram 39-72. 🇺🇸

UNIFORMED SERVICES

MEDICAL/DENTAL SCHOOLS

President Nixon has signed a bill clearing the way for a uniformed services medical and dental school and a comprehensive new medical and dental scholarship program.

The bill which was signed on 21 Sept authorizes establishment of a uniformed services University of Health Sciences within a 25-mile radius of Washington, D.C. Students will be commissioned officers on active duty in Grade O-1. Upon graduation, they will serve at least seven years on active duty, in addition to the time spent in military residency or internship.

The new Medical and Dental Scholarship Program is open to students who have been accepted or are enrolled in an accredited medical or dental school. Persons accepted for the program will serve on inactive duty as reserve officers in Grade O-1, with a monthly stipend of \$400. At least one year of active duty obligation will be required for each year of participation in the Scholarship Program, exclusive of the time spent in military residency or internship.—CHINFO Newsgram 39-72. 🇺🇸

THREE THAI

SURGEONS GENERAL FETED

On behalf of ADM John S. Mc Cain, Jr., USN, the Commander-in-Chief, Pacific (CINCPAC), RADM Charles L. Waite, MC, USN, CINCPAC Surgeon,



RADM CHARLES L. WAITE, MC, USN, Fleet Medical Officer, CINCPACFLT, confers with the three Thai Surgeons General on military medical assistance matters. Pictured from left to right are: LTGEN THIP PHOLPOKE, RTA Surgeon General; COL Jack DOYLE, MC, USA, MAG-THAI Surgeon (in left corner); RADM WAITE; AIR MARSHAL TRAGOOL THAVARAVEJ, RTAF Surgeon General; LTCOL BONNER, MC, USAF (back to camera), and; VADM ARUN RATTARANGSI, RTN Surgeon General.

hosted an awards ceremony and luncheon for the three Royal Thai Armed Forces Surgeons General.

The unusual event took place in the banquet room of the Chao Phya Hotel in Bangkok, Thailand at 1245 hours on 16 Aug 1972. RADM Waite presented plaques to: Air Marshal Tragool Thavaravej, MC, Royal Thai Air Force (RTAF) Surgeon General; VADM Arun Rattarangsi, MC, Royal Thai Navy (RTN) Surgeon General, and; LTGEN Thip Pholpoke, MC,



RADM CHARLES L. WAITE congratulates AIR MARSHAL TRAGOOL THAVARAVEJ, RTAF Surgeon General after awarding him a certificate on behalf of the Naval Aerospace Medical Institute, Pensacola, designating him an Honorary Naval Aviation Medicine Indoctrinee.

Royal Thai Army (RTA) Surgeon General.

Air Marshal Tragool Thavaravej, a distinguished flight surgeon and Fellow of the Aerospace Medical Association, was also awarded a set of Honorary Navy Flight Surgeon's Wings and Certificate. He has been previously awarded honorary U.S. Army and Air Force flight surgeon wings. 🌿

SURGICAL SYMPOSIUM

THE GARY P. WRATTEN SURGICAL SYMPOSIUM will be sponsored by the Walter Reed General Hospital on Monday, Tuesday and Wednesday, 9-11 April 1973. The Surgeon General of the Army has given his strong support to this seminar. An outstanding program is being arranged and will include recent advances in the fields of general surgery and the surgical specialties, new advances in clinical research and new procedures and techniques. Civilian surgeons of national prominence are included on the program.

You are urged to make application for presentation of papers. *Presentations will be limited to 15 minutes* with few exceptions. Case reports will also be accepted, limited to five minutes. Submit the title of your paper together with an *abstract of not more than 200 words*, and time desired for presentation, *not later than 1 Jan 1973*, in duplicate. Mail to:

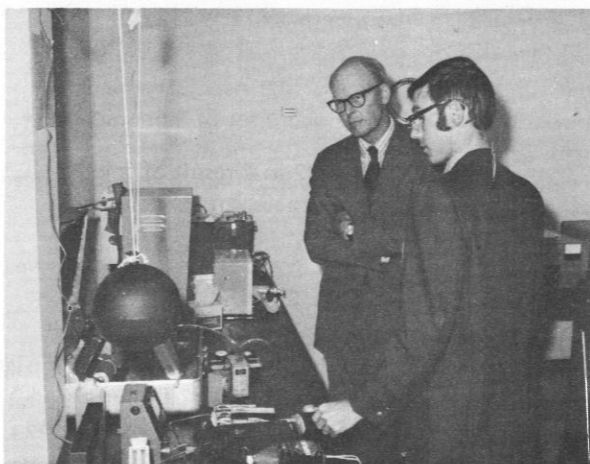
COL THOMAS G. NELSON, MC, USA
Chief, Department of Surgery
Walter Reed General Hospital
Washington, D.C. 20012

The Symposium is open to surgeons of the Army, Air Force, Navy, Veterans Administration, Public Health Service and also civilians, particularly from the Reserve Corps and National Guard. All are invited and encouraged to attend. Social events will include the wives.

Make your plans to attend and send your request for a space on the program promptly. 🌿

NIEHC VISITED

The Navy Industrial Environmental Health Center (NIEHC) in Cincinnati, Ohio was honored by a distinguished guest on 13 Sept 1972. The Deputy Assistant Secretary of Defense for Environmental Quality, Mr. John A. Busterud visited the Center, expressing his interest and appreciation for a tour of the facility and the briefings provided him.



Industrial hygienist James Crawl (right) demonstrates environmental health monitoring equipment to Mr. Busterud, the Deputy Assistant Secretary of Defense for Environmental Quality.



Mr. Busterud (center) is accompanied on his tour of the facility by: CDR George M. Lawton, MC, USN (left), Officer-in-Charge of the NIEHC, and; Dr. William A. Redman (right) Deputy Director, NIEHC.

✠ In Memoriam ✠

CAPT Henry G. Bullwinkel, MC, USN, (Ret.) died 9 Sep 1972 at the Naval Hospital Annapolis, Md. He was born in Brooklyn, N.Y., on 31 Dec 1893. An EEN&T specialist, Dr. Bullwinkel graduated from the College of Physicians and Surgeons in 1920. He was commissioned LT(jg), MC, USNR in 1923 and was called to active duty prior to World War II. Following flight training at NAS Pensacola, he was designated a flight surgeon in 1943 and served in the Pacific theater.

After a short period of inactive duty following the war, Dr. Bullwinkel returned to active duty and later served as Chief, EEN&T Dept. at Naval Hospital Philadelphia. At the time of his retirement in Jan 1956, CAPT Bullwinkel was serving as a medical member of the Physical Disability Appeal Board, Navy Dept., Washington, D.C.

Dr. Bullwinkel was a Fellow of the American College of Surgeons and the American Academy of Ophthalmology and Otolaryngology, as well as a Diplomate of the American Board of Otolaryngology.

CAPT Bullwinkel is survived by his wife, Lola, who resides in Annapolis, Md.

LT Michael F. Conway, MSC, USN (Ret.) died at the Naval Hospital Bethesda, Md. on 30 Sep 1972 following a prolonged illness. Mr. Conway was born in Waterbury, Conn. on 13 Nov 1937.

He entered naval service in Feb 1958 and attended

the Hospital Corps School at Great Lakes following recruit training there. In Sep 1966 he was commissioned ENS, MSC, USN, while attached to the Naval Dispensary in Washington, D.C., as an HM1.

Mr. Conway subsequently served as an Administrative Assistant at the Naval Hospital Bethesda and assumed duties as the Bureau of Medicine and Surgery



LT Michael F. Conway, MSC, USN (dec.) is seen at VADM Davis' left side in photo taken in May 1972.

Public Affairs Officer in Apr 1968. From July 1969 to June 1970, LT Conway attended the Naval School of Hospital Administration, NNMC, Bethesda, Md., after which he became Aide to the Surgeon General of the Navy. He served in this capacity until his retirement for total disability on 7 Sep 1972.

LT Conway was awarded the Meritorious Service Medal at the time of his retirement. He is survived by his wife, Alice; a son, Michael; and a daughter Theresa.

LCDR Stephen A. Ferdinand, MSC, USN (Ret.) died of cerebral artery thrombosis on 19 Aug 1972 at the VA Hospital, Long Beach, Calif. He was born on 6 Dec 1906 in Los Angeles, Calif.

He enlisted in the U.S. Navy in Aug 1924 and after completing Hospital Corps School in Mar 1925, he subsequently served aboard several ships including the hospital ship *USS Relief*. While serving aboard the *USS Isabel* in Feb 1942, he participated in the rescue and treatment of 181 survivors of a torpedoed vessel in the Java Sea. During the following weeks he was given charge of patients being evacuated from Tjilatjap, Java to Melbourne, Australia. In Nov 1942, he was promoted to Pharmacist and in the following year was commissioned ENS (HC).

LCDR Ferdinand's name was placed on the Retired List in July 1956. He is survived by his wife, Mary who resides in Long Beach, Calif.

CAPT Ira C. Nichols, MC, USN (Ret.) died in San Diego, Calif. on 6 Sep 1972 as a result of injuries sustained in an automobile accident.

Dr. Nichols was born in Attleboro, Mass. on 26 Apr 1902. After receiving his M. D. degree from the College of Physicians and Surgeons in New York, he was commissioned LCDR, MC, USN and began his naval service in Sep 1941.

Dr. Nichols was designated a flight surgeon after graduation from the School of Aviation Medicine in 1942. He served as Chief of the Neuropsychiatry Service at Tripler Hospital, Hawaii, from May 1949 to Aug 1950; he also served in that capacity at several naval hospitals, including those at Newport, R.I. & Boston, Mass. Later he became Executive Officer of the Naval Hospitals Yokosuka, Japan, and Chelsea, Mass.

After a term of service as FIRST Naval District Medical Officer, CAPT Nichols' name was placed on the Retired List as of 1 July 1963. Mrs. Nichols also died as a result of injuries received in the same tragic accident. 🌹



DR. WOLFF SIGNS IN — Greeted by RADM Oscar Gray Jr., MC, USN (left), CO Naval Aerospace and Regional Medical Center Pensacola, Dr. William I. Wolff (right) was guest speaker at a professional luncheon meeting recently held at Naval Hospital Pensacola. Director of Surgery at Beth Israel Medical Center and Professor of Clinical Surgery at Mt. Sinai School of Medicine in New York, Dr. Wolff is renowned for his work in fiberoptic colonoscopy. He spoke on "Recent Developments in Diagnosis and Treatment of Colon Diseases."—PAO, Naval Aerospace and Regional Medical Center, Pensacola, Fla. 🌹

ERRATUM

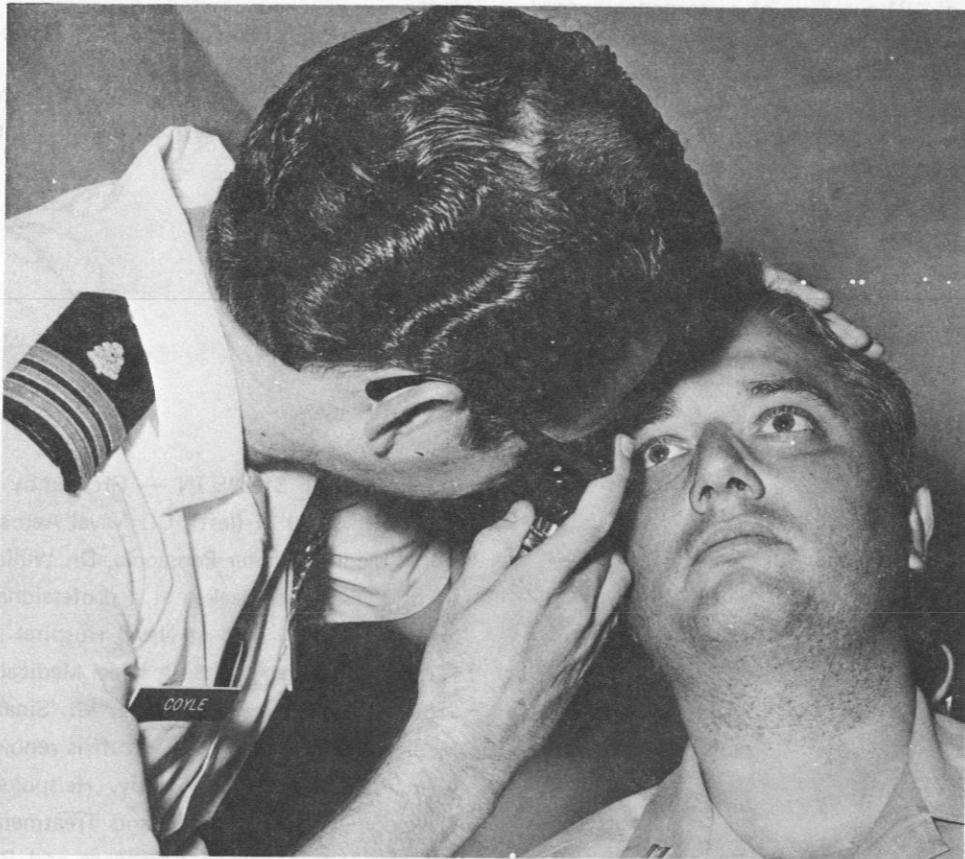
Attention is invited to the article entitled "Hospital Acquired Infections: Their Effect on Patients and Resources," by LT James H. Lewis, MSC, USNR and LCDR Gerald G. Comfort, MSC, USN. The article appeared in U.S. NAV MED 60(2):34-39, Aug 1972. In Table 2 on page 37, the "Excess as % of Total^b" should have been cited as 0.8% (vice 8%).

We regret this unfortunate typographical error. 🌿

AEROSPACE MEDICINE RESIDENCY

Ophthalmology provides one of the clinics where aerospace medicine residents gain practical experience for three months as part of their two-year residency training at the Naval Aerospace Medical Institute, Pensacola, Fla. After obtaining a Master of Public

Health degree, and completing the two years in Pensacola, the physicians are eligible to take the American Board examinations in Preventive Medicine. Upon certification the doctors become eligible for billets such as senior medical officer in aircraft carriers.



LCDR Radcliffe T. Coyle, MC, USN, an aerospace medicine resident at the Naval Aerospace Medical Institute, Pensacola, conducts ophthalmoscopic examination during his clinical training. Dr. Coyle graduated from the University Autonoma of Guadalajara, Mexico, and has served in the Navy for five years. He was promoted to CDR in Oct.—PAO, Naval Aerospace Medical Institute, Pensacola, Fla. 🌿

United States Navy Medicine

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SUGGESTIONS are invited concerning U.S. Navy Medicine, its content and form.

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CAPT Donald W. Robinson, MC, USN (Commanding Officer Nav Hosp Charleston, S.C., at the time) greets Lady and Governor Bradford on Thanksgiving Day at Charleston in 1971. Dr. and Mrs. Stanley Permowicz played the roles of Governor and Lady Bradford, respectively.

U.S. NAVY MEDICINE